

INVESTMENT REPORT

MASSACHUSETTS CONTRIBUTORY

RETIREMENT SYSTEMS

FOR PUBLIC

EMPLOYEES

DECEMBER 31, 1986

Public Employee Retirement Administration
John J. McGlynn
Commissioner of P.E.R.A.
Frank F. Keefe
Secretary of Administration
and Finance
Michael S. Dukakis
Governor

T. DUSTIN ALWARD

was a public servant, a firefighter, a union leader. He was a man of vision and scope, with a superior intellect that mastered those issues in law, medicine and finance that concerned his membership, his community and his Commonwealth. Leaders in government and business treasured him as a valued ally and respected him as an honorable adversary. He was a tireless advocate for those who stood beside him in the arena...his brother firefighters.

As President of the Professional Firefighters of Massachusetts, Dusty had a unique understanding of the importance of the public employee pension systems to the security of his members. His courage in working for legislation to improve the operation of our retirement systems was matched only by the tenacity with which he defended the benefits of his firefighters and fought for more.

Chapter 66I of the Acts of 1983 greatly enhanced the ability of our pension systems to improve their investment performance. The outstanding investment returns indicated in this report give testament to the foresight of those who worked on behalf of Chapter 66I. That statute would not have passed without Dusty's active support.

For his work as a member of the Pension Reserves Investment Management Board, and for his untiring efforts to make our retirement systems administratively and fiscally secure, this Division dedicates this report to T. Dustin Alward.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
FOR PUBLIC EMPLOYEES

INVESTMENT REPORT

December 31, 1984 through December 31, 1986

We are pleased to present this second annual report on the investment activity of the Massachusetts Contributory Retirement Systems. In this 1986 Investment Report, we continue the analysis that began in 1985 to consistently and accurately evaluate the investment activity of the public pension sector in Massachusetts. This report provides a basis for comparing the investment performance of our public pension systems with those of other governmental pension plans and with private pension plans across the country.

On December 20, 1983, Governor Dukakis signed Chapter 66I into law, fundamentally changing the way public pension systems in Massachusetts manage their investment portfolios. Immediately upon enactment of Chapter 66I, the State Employees' and Teachers' Retirement Systems were freed from statutory investment restrictions and authorized to invest using a "prudent person" standard, thus enabling them to compete with other public and private pension plans.

The new statute also established the Pension Investment Advisory Unit within PERA, whose mandate was to provide greater oversight of the investment activities of the public pension systems and establish a uniform, generally accepted and comparable measure of investment performance. PERA was further authorized to establish a process that would allow local retirement systems to move beyond statutory investment restrictions if, by experience and resources, they could show the sophistication to invest in broader opportunities.

With assistance and input from many interested parties, PERA developed regulations that would allow local retirement systems to qualify for exemption from the statutory "legal list" restrictions. During 1985, the year these regulations were promulgated, 59 systems qualified for investment waivers from PERA. As of the date of this report, 68 systems have been granted investment waivers. More revealing is the fact that approximately 94 percent of the \$8.1 billion of public employee retirement system assets is now being professionally managed and invested using a "prudent person" investment standard.

While many retirement systems chose not to enter this new marketplace, unrestricted by statutory restrictions, Chapter 66I recognized that the 106 Massachusetts public employee retirement systems vary widely in many ways: the size of the funds, the number of active and retired members, the types of assets in their portfolios, the fiscal capability of their governmental units, and the composition and expertise of their boards. Recognizing that many systems would see advantages in pooling their resources and obtaining state-of-the-art investment expertise, Chapter 66I established the Pension Reserve Investment Trust Fund (PRIT Fund) as a sophisticated, well managed investment pool which local systems could either voluntarily choose to participate in or invest in by purchasing shares in the fund. As an incentive to those local systems that choose to participate in PRIT, Chapter 66I set aside an additional state appropriation. As of this writing, 12 local retirement systems have taken advantage of the PRIT opportunity as participating systems. Additionally, 8 other systems have purchased shares in the PRIT Fund.

In 1985, PERA initiated the development of a centralized data base to monitor the investment performance and regulatory compliance of all retirement systems and the PRIT Fund. Data entry and analysis of 1985 performance took PERA 19 months to complete. That same process for 1986 has been accomplished in 10 months. We deeply appreciate the cooperation of the retirement systems and the resources provided by Governor Michael S. Dukakis, Secretary of Administration Frank T. Keefe, the Legislature, and the House and Senate Committees on Ways and Means that made development of this centralized information possible.

In this Investment Report, we hope to present a picture of activities and trends in the investment of the Commonwealth's \$8.1 billion in public employee retirement assets. Before moving to a substantive discussion, however, let us restate and re-emphasize a point made in the first PERA Investment report issued last January:

All of the investment expertise which has been made available to our Pension

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Approved by the State Purchasing Agent

Investment Advisory Unit has been unanimous on the critical need not to judge investment performance over short time horizons. We have been convinced, conclusively, that to effectively compare investment performance, the investment managers being compared must be seen over a full business cycle -- typically three to five years. Some managers perform well in up markets. Others have greater success in down markets. The only true comparison is one that has been made after a full cycle including ups and downs.

To that end, we encourage you to place greater emphasis on the annualized 1985-1986 performance data rather than that of either of the two individual years.

With that caveat, there are several points that can be made about the investment activity, performance and growth of the Commonwealth's public employee pension systems and their assets.

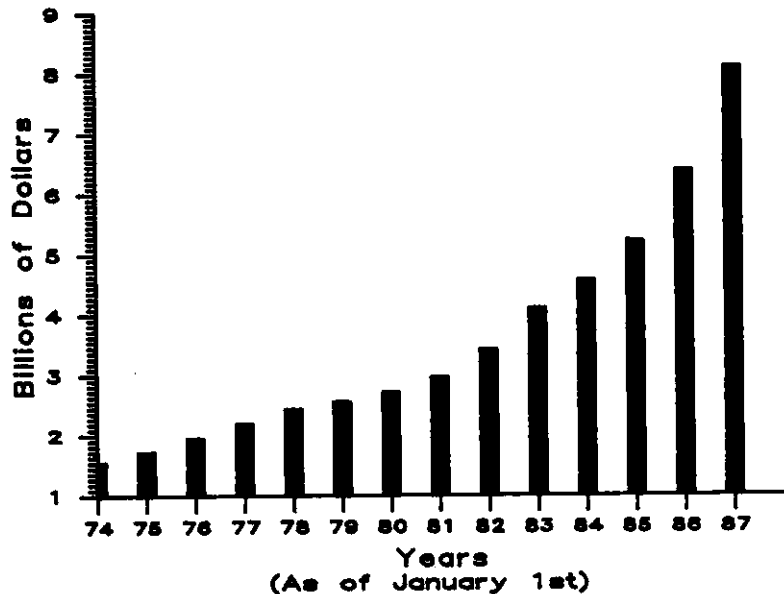
Asset Growth

The first can be seen in the chart on the right. The combination of the State government's Pension Reserve appropriations, the improved investment returns achieved under the prudent person standard, and the retention of all investment income in local systems' Pension Reserves under the provisions of Chapter 66I, has led to great acceleration in the growth of the Commonwealth's pension assets. The systems' assets totaled \$1.552 billion on January 1, 1974. It took eight years for these assets to double, reaching \$3.413 billion on January 1, 1982. In the next five years (three of which were under Chapter 66I), the assets more than doubled again, growing to \$8.082 billion on January 1, 1987.

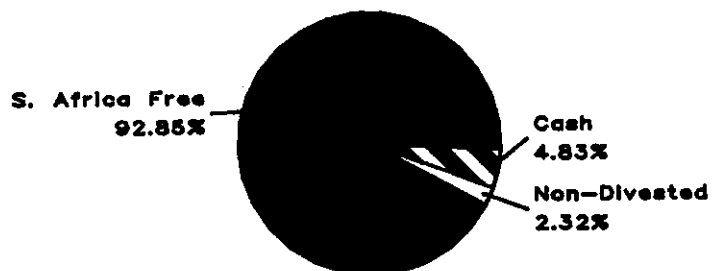
South Africa Divestiture

This asset growth has been maintained while the Commonwealth has pursued a posture as a socially responsible investor. Since January 1983, the Commonwealth has invested its assets in enterprises free of involvement in South Africa. The State Employees' and Teachers' Retirement Systems, and the 12 participating systems in the Pension Reserve Investment Trust Fund, are investing South Africa free. Several local communities have followed the state's lead. As of January 1, 1987, over 97 percent of the \$8.082 billion in public pension assets is South Africa free.

Massachusetts Pension System Asset Growth



Massachusetts Pension System South Africa Holdings



Total Assets: \$8.082 Billion

Comparative Performance

The investment performance of the Commonwealth's public pension assets continues to be encouraging in the two years that the "prudent person" standard has been in place. An analysis of the combined performance of the 106 retirement systems' portfolios indicates that the two-year (1985-1986) annualized time-weighted rate of return exceeded the performance of an aggregate composite index representing the aggregate asset mix of the retirement systems' portfolios.

The aggregate investment performance of the Massachusetts pension systems also compared favorably with the performance of other public and private pension funds nationwide. The 1986 rate of return for these funds was greater than the median investment return of balanced, state, and local government funds monitored by SEI Associates. On a two-year annualized basis, the retirement systems performed well within each asset class. Annualized returns for fixed income, equity and cash for 1985-1986 compared favorably with both standard indices for each asset type and the SEI universe of balanced, state, and local government funds.

One of the principal tenets underlying Chapter 66I is the belief that there are tremendous economies of scale and command of resources that can be attained by pooling retirement system assets together for investment purposes. A careful examination of the comparative performance analysis by size of pension portfolios clearly gives testament to the Chapter 66I idea. There is a direct correlation between size and performance. The larger the fund, the better the performance. While there are individual exceptions, there can be no denying that basic premise. This correlation holds true for the two-year annualized performance, as well as the individual performance figures for the years 1985 and 1986.

Asset Allocation

The single most important investment decision made by the board of any system is the allocation of its portfolio to different asset classes and the prompt investment of new funds according to that allocation.

The following is borrowed from a recent column by Jane Bryant Quinn:

"...careful "asset allocation" which--simply put--means deliberately dividing your money among stocks, bonds, cash and other types of investments. According to a study by the First National Bank of Chicago, asset allocation is the long-run determinant of your investment success or failure, not how smart (or dumb) you are in picking particular stocks or mutual funds.

But the moral is more than "diversify to protect your rear." The key to this strategy is continually returning to the original division among stocks, bonds and cash to limit your risk.

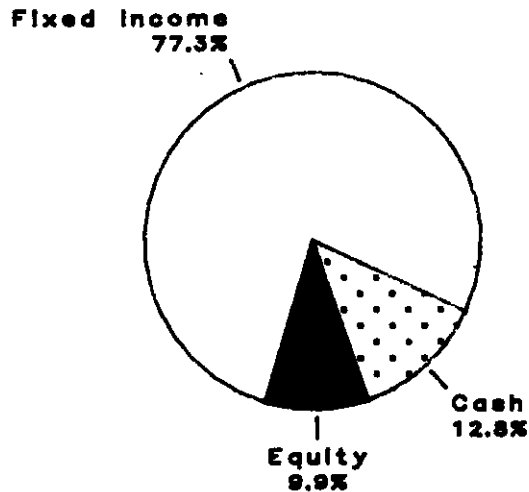
Most investors keep more and more of their money in stocks as the market rises, which makes their positions ever-more dangerous. When the bear strikes, they have more to lose.

Conversely, they are afraid to buy when times are bad, so they lose their chance to get stocks cheap. That's another beauty of keeping your stock and bond investments as a fixed ratio: It combats those bad-timing impulses that cost you money."

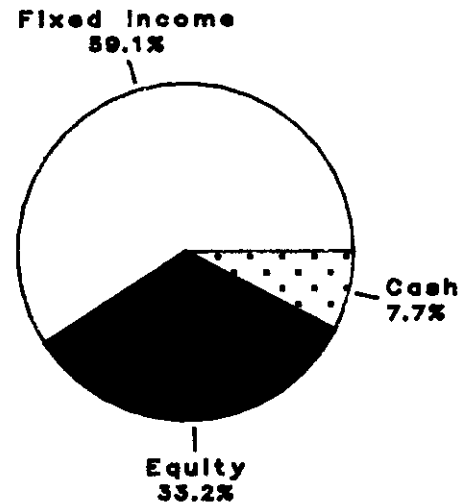
An analysis of the tables that appear in this report clearly shows that those systems which had extensive holdings in cash or cash equivalents (checking accounts, savings accounts, money market funds, commercial paper, certificates of deposit or repurchase agreements) performed poorly in comparison to those systems that quickly put their funds to work in equities or fixed income securities. Some systems made a conscious choice in favor of cash and against equity and fixed income securities. Other systems with large cash holdings were victims of poor planning and management that did not get funds promptly invested. As there is a correlation between system size and performance, there is a correlation between cash allocations and performance. The greater the cash allocation, the poorer the performance. Not surprisingly, there is a similar correlation that the smaller the system, the greater the cash allocation.

Consistent with the professionalization of retirement system investment management, with the importance of asset allocation, and with the restructuring of portfolios that took place as a result of the Chapter 661 freedom from the "legal list" investment restrictions, a significant shift from fixed income securities to equities in waived systems, and from cash into equities in "legal list" systems is apparent.

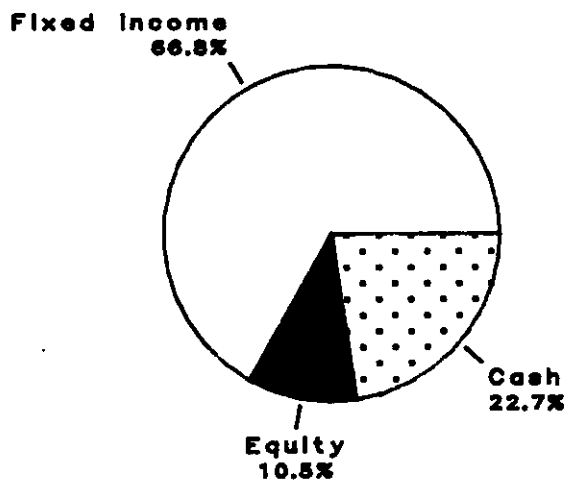
**Asset Allocation
Exempt Systems
January 1, 1985**



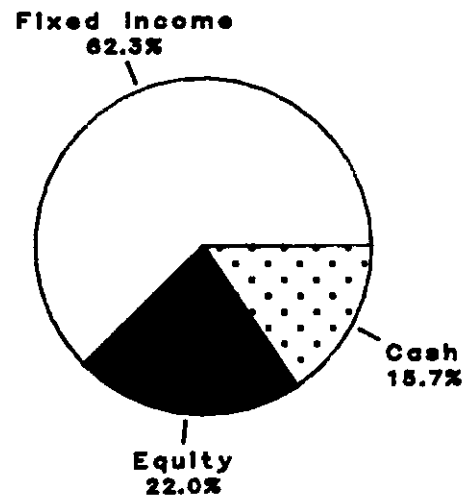
**Asset Allocation
Exempt Systems
January 1, 1987**



**Asset Allocation
Legal List Systems
January 1, 1985**

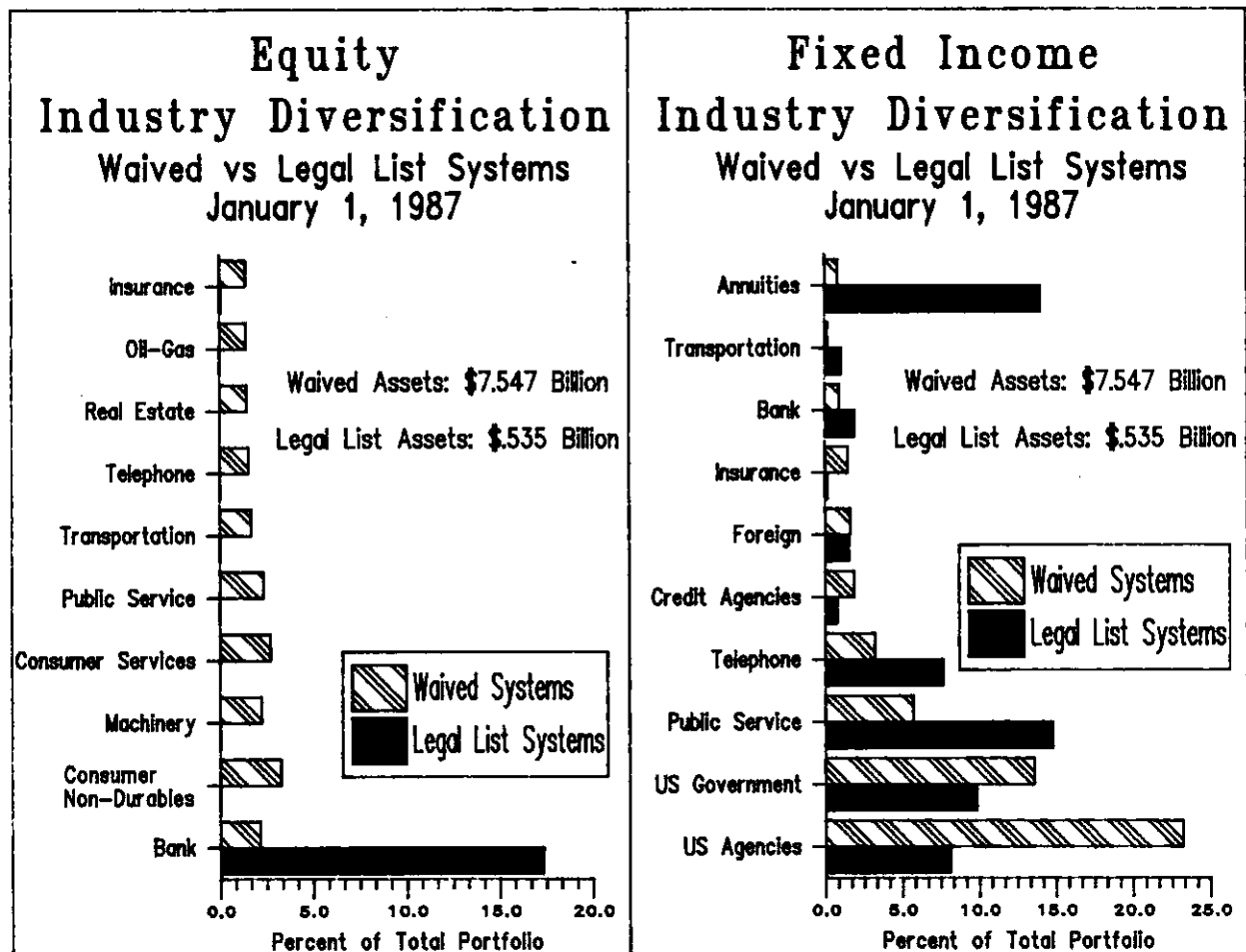


**Asset Allocation
Legal List Systems
January 1, 1987**



One of the other significant shifts in asset allocation has been the diversification of the systems' portfolios over a broad range of industries within each asset class. Particularly in equities, the "legal list" requires that investments be made in a narrow range of regulated industries. As of January 1, 1987, the accompanying charts indicate that "legal list" systems had their entire equity exposure concentrated in bank stocks. This proved fortuitous in 1985, particularly as new laws allowing regional banking resulted in a run-up in the value of New England bank stocks. Over time, however, the broad diversification achieved by the waived systems will improve both the return and security of the investment portfolios.

In the fixed income area, there has been less of a difference in industry concentration. Perhaps the vagaries of the retirement statute in Massachusetts (which carries fixed income investments at amortized book values and further requires losses incurred when such securities are sold at market values below that amortized book to be made up through the appropriation process) partially explain the slower pace by which industry diversification is being achieved in the fixed income portfolios.



This 1986 Investment Report would not have been possible without the dedication and efforts of PERA's Pension Investment Advisory Unit under the leadership of Director Lisa R. Reibstein and the board and staff members of the Commonwealth's pension systems. The many investment advisors and custodian banks that serve our pension systems also deserve commendation for their assistance and cooperation in the compilation and verification of data essential for this report.

Continued success in the implementation of the broad authority established by Chapter 66I will require careful monitoring by PERA. Success will also require active support and involvement by retirement board members in the exercise of their fiduciary responsibilities, an open mind by all to look at the facts as they exist, and the exercise of our collective authority in the long-term best interests of the 350,000 men and women whose financial future depends on the good judgment of the retirement board fiduciaries.

The Division of Public Employee Retirement Administration
Pension Investment Advisory Unit

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
FOR PUBLIC EMPLOYEES

INVESTMENT REPORT

12/31/84 - 12/31/86

Investment Report

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PERA'S MONITORING SYSTEM

Since January 1, 1985 PERA's investment regulations have required each retirement system to send to PERA copies of cash book and journal entries for each month, monthly trial balances, and broker confirmations for all security transactions.

PERA's Pension Investment Advisory Unit assembles this information, interprets it where necessary to achieve uniformity, and enters it into a monitoring system provided on contract to PERA by Interactive Data Corporation. PERA utilized the Annual Statements filed by the retirement systems for the year ending December 31, 1984 to establish the initial portfolio position of each system.

That initial position, and transaction journals indicating investment activity for each quarter as entered by PERA, were sent to each retirement system so that the system could audit PERA's information and insure its accuracy. As an additional check, the closing position for each system as of December 31, 1985 was reconciled to the system's Annual Statement of Financial Condition for the year ending as of that date. The closing position as of December 31, 1986 was, for the majority of the systems, reconciled to each system's Annual Statement of Financial Condition for that year.

The performance evaluation in this monitoring system is done using Bank Administration Institute Standards, which are those generally accepted in the investment community.

Contributions and withdrawals are entered at mid-month. Purchases and sales are entered on their trade dates. Fixed income interest is entered on an accrual basis. Short-term interest is entered on a cash basis. Dividends are entered on their ex-date. Market values for the portfolios are appraised quarterly and performance is linked on a quarterly basis. Performance for the two year, 1985-1986, period has been annualized.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

TABLE # 1

SYSTEM PERFORMANCE
Asset Value; Investment Management

PAGE ONE

System	1985-1986 Annualized Time Weighted		1985 Time Weighted		1986 Time Weighted		12/31/86 Market Value	12/31/86 Book Value	Date of Waiver/ Joined PRIT	Investment Manager(s)
	Rank	Return	Rank	Return	Rank	Return				
Adams	57	17.41	14	26.32	102	09.14	\$3,452,223	\$3,478,522		
Amesbury	93	14.33	86	18.61	89	10.20	\$5,826,993	\$5,700,920	4/85	Richard H. Morse
Andover	11	20.83	13	26.80	36	15.15	\$9,635,068	\$9,412,502		
Arlington	43	18.38	68	20.13	18	16.65	\$29,106,366	\$27,822,549	3/85	Constitution Capital Mgmt.
Athol	88	14.75	71	19.91	94	09.82	\$2,372,837	\$2,358,065	6/85	Shawmut/Worcester County
Attleboro	73	16.34	73	19.87	63	12.91	\$10,274,003	\$10,278,244	4/85	BayBank Inc.
Barnstable Co.	63	16.84	57	21.15	64	12.68	\$43,564,514	\$41,785,658		
Belmont	71	16.52	26	23.90	97	09.59	\$13,914,250	\$15,344,283	3/85	de Burlo Group
Berkshire Co.	55	17.50	52	21.92	57	13.24	\$13,008,928	\$13,359,927		
Beverly	64	16.78	62	20.71	61	12.98	\$15,375,065	\$15,448,215		* Alex Brown
Blue Hills	102	12.50	104	11.66	54	13.35	\$1,785,005	\$1,775,141	4/85	David L. Babson
Boston	13	20.79	17	25.65	24	16.12	\$697,788,325	\$703,710,105	2/85	* Multiple Advisors
Braintree	31	19.60	36	22.89	21	16.40	\$17,754,889	\$17,415,941	4/85	* Drexel Burnham Lambert
Bristol Co.	75	16.14	59	21.06	79	11.43	\$42,215,952	\$41,699,224	3/85	de Burlo Group
Brockton	59	17.31	46	22.37	67	12.46	\$45,680,253	\$44,027,458	3/85	Fort Hill
Brookline	96	13.99	97	16.24	76	11.79	\$29,945,180	\$35,111,623	6/86	State Street Research
Cambridge	2	24.10	2	31.97	16	16.70	\$88,224,417	\$86,161,946		
Chelsea	39	18.64	24	24.05	52	13.47	\$12,154,149	\$12,250,606	3/87	Keystone Investment Mgmt.
Chicopee	83	15.28	66	20.23	87	10.53	\$23,004,916	\$24,891,714	6/86	Tucker Anthony Mgmt. Co.
Clinton	19	20.39	4	28.89	68	12.46	\$3,893,711	\$3,886,927		* Alex Brown
Concord	98	13.68	96	16.77	86	10.67	\$8,235,909	\$8,305,605	5/86	* Multiple Advisors
Danvers	92	14.39	84	19.14	92	09.83	\$15,394,086	\$15,011,819	4/85	Richard H. Morse
Dedham	23	20.06	8	27.95	65	12.66	\$8,548,320	\$8,550,484		* Aetna
Dukes County	70	16.53	41	22.70	85	10.68	\$3,416,607	\$3,417,214		
Easthampton	56	17.45	60	20.95	46	14.06	\$3,756,733	\$3,738,164	4/85	Nrthhmpntlnst.for Savings & Wright Invest. Services
Essex County	9	21.10	19	25.18	12	17.15	\$34,703,113	\$35,086,701	5/85	Tucker Anthony Mgmt. Co.
Everett	47	17.91	45	22.43	50	13.56	\$16,016,131	\$16,034,944	2/85	BayBank Inc.
Fairhaven	81	15.45	55	21.53	95	09.67	\$3,464,878	\$3,466,516	7/86	PRIM Board
Fall River	22	20.14	20	25.13	33	15.35	\$40,420,340	\$40,648,724	8/85	BayBank Inc.
Falmouth	82	15.35	88	18.36	71	12.41	\$6,651,671	\$6,710,089	4/85	State Street Bank
Fitchburg	97	13.87	99	15.34	70	12.41	\$15,401,586	\$15,758,367	4/85	First Safety Fund Nat.
Framlingham	72	16.43	81	19.37	49	13.57	\$24,118,416	\$24,711,089		
Franklin Co.	101	12.91	89	18.33	105	07.73	\$7,796,976	\$7,859,806	12/85	de Burlo Group
Gardner	74	16.15	80	19.45	62	12.94	\$6,216,065	\$6,290,180	5/85	* PRIM Board
Gloucester	10	21.05	16	25.70	19	16.57	\$11,230,254	\$9,628,091 *	4/85	Tucker Anthony Mgmt. Co.
Gr.Lawrence	106	07.48	106	07.68	106	07.28	\$2,497,826	\$1,514,915	7/86	Arlington Trust Company
Greenfield	85	15.20	93	17.24	58	13.19	\$5,441,397	\$5,390,660	7/86	Bank of New England-West

TABLE # 1

SYSTEM PERFORMANCE
Asset Value; Investment Management

PAGE TWO

System	1985-1986 Annualized		1985		1986		12/31/86 Market Value	12/31/86 Book Value	Date of Waiver/ Joined PRIT	Investment Manager(s)
	Time Weighted Rank	Return	Time Weighted Rank	Return	Time Weighted Rank	Return				
Hampden County	60	17.28	61	20.79	47	13.87	\$32,841,878	\$33,230,632	8/85	* Boston Company
Hampshire Co.	91	14.42	94	17.18	77	11.73	\$20,465,143	\$20,193,886	4/85	Bank of New England-West
Haverhill	30	19.71	40	22.70	14	16.79	\$22,903,678	\$23,543,906	7/85	Boston Company
Hingham	38	18.76	47	22.29	34	15.32	\$8,445,976	\$8,070,699	12/86	Constitution Capital
Holyoke	12	20.82	9	27.87	45	14.15	\$30,311,188	\$29,760,496	12/85	* Multiple Advisors
Hull	94	14.28	92	17.27	80	11.36	\$3,635,108	\$3,643,458	7/85	Fort Hill
Lawrence	48	17.82	31	23.68	72	12.24	\$24,785,172	\$24,928,848	1/86	National Investment Services of America Inc.
Leominster	78	15.87	77	19.64	73	12.22	\$10,132,801	\$10,204,419	4/85	First Safety Fund Nat.
Lexington	16	20.47	18	25.47	31	15.67	\$15,131,012	\$13,126,937 *		*
Lowell	58	17.32	67	20.22	43	14.50	\$33,052,403	\$33,274,992		
Lynn	49	17.80	32	23.67	75	12.20	\$45,706,646	\$46,301,748	3/85	de Burlo Group
Malden	80	15.65	48	22.27	99	09.38	\$19,671,378	\$19,662,685	3/85	de Burlo Group
Marblehead	89	14.67	54	21.90	104	07.87	\$10,962,904	\$10,889,954	4/85	de Burlo Group
Marlborough	79	15.74	53	21.90	91	09.90	\$9,634,240	\$9,516,224		
MHFA	105	09.48	105	09.57	98	09.39	\$6,499,462	\$5,534,167 *	6/87	PRIM Board
Mass Turnpike	29	19.76	42	22.68	13	16.90	\$41,173,029	\$38,525,278		
MWRA	107	03.45			107	05.78	\$302,586	\$303,876		
MassPort	18	20.41	50	22.17	9	18.68	\$51,010,268	\$48,382,621	2/85	Thorndike,Doran,Paine&Lewis
Maynard	40	18.52	10	27.79	90	09.92	\$3,229,902	\$3,206,536		* Alex Brown
Medford	50	17.71	64	20.34	37	15.13	\$22,756,135	\$22,466,974	3/85	Constitution Capital Mgmt.
Melrose	37	18.80	58	21.15	20	16.49	\$11,441,835	\$11,863,519	4/85	Constitution Capital Mgmt.
Methuen	65	16.72	70	20.03	51	13.50	\$9,874,323	\$9,740,995	10/86	David L. Babson
Middlesex Co.	36	18.84	35	22.92	39	14.90	\$119,999,348	\$119,324,288	3/85	* Multiple Advisors
Milford	95	14.19	76	19.66	103	08.97	\$7,471,516	\$7,447,843		
Milton	67	16.60	43	22.54	82	10.94	\$11,791,274	\$11,987,515	7/86	PRIM Board
Minuteman	53	17.52	103	13.17	1	22.05	\$1,104,037	\$1,028,711	7/85	PRIM Board
Montague	104	11.20	102	13.27	101	09.16	\$2,106,365	\$2,249,936	3/86	* PRIM Board
Natick	25	20.05	15	25.80	42	14.56	\$11,816,239	\$13,258,187	3/85	United Investment Counsel
Needham	21	20.17	78	19.58	4	20.75	\$21,575,921	\$22,525,951	3/85	* PRIM Board
New Bedford	54	17.51	56	21.47	48	13.68	\$43,159,111	\$42,299,616		*
Newburyport	90	14.50	69	20.08	100	09.18	\$5,206,471	\$5,166,029	3/85	Richard H. Morse
Newton	44	18.33	44	22.47	44	14.33	\$75,352,963	\$74,660,573	3/85	* Multiple Advisors
Norfolk County	15	20.58	29	23.78	11	17.47	\$72,544,780	\$71,797,374	11/85	PRIM Board
North Adams	66	16.61	28	23.79	93	09.83	\$6,031,558	\$5,969,063	3/85	de Burlo Group
North Attleboro	86	15.12	90	17.64	66	12.65	\$6,547,882	\$6,522,787	2/87	Keystone Investment Mgmt.
Northampton	61	17.16	51	22.07	69	12.45	\$8,279,354	\$8,236,474	4/85	de Burlo Group
Northbridge	87	14.75	82	19.33	88	10.34	\$2,471,128	\$2,443,904	4/85	Shawmut/Worcester County
Norwood	84	15.22	95	17.18	56	13.30	\$18,910,808	\$18,403,018	3/85	Constitution Capital Mgmt.

TABLE # 1

SYSTEM PERFORMANCE
Asset Value; Investment Management

PAGE THREE

System	1985-1986 Annualized Time Weighted		1985 Time Weighted		1986 Time Weighted		12/31/86 Market Value	12/31/86 Book Value	Date of Waiver/ Joined PRIT	Investment Manager(s)
	Rank	Return	Rank	Return	Rank	Return				
PRIM Board	7	21.37	38	22.75	7	19.94	\$1,802,018,353	\$1,802,018,353	12/83	* Multiple Advisors
Peabody	32	19.44	34	23.23	29	15.77	\$21,483,061	\$21,631,937	7/85	Tucker Anthony Mgmt. Co.
Pittsfield	42	18.43	23	24.07	60	13.05	\$22,846,140	\$23,207,685	12/86	* Multiple Advisors
Plymouth	4	21.91	5	28.43	30	15.73	\$13,613,427	\$13,184,411		
Plymouth County	14	20.62	21	24.65	15	16.71	\$69,050,122	\$68,787,011	5/85	* John McLellan
Quincy	77	15.93	85	18.62	55	13.31	\$54,519,288	\$53,650,852	5/85	South Shore Bank
Reading	41	18.52	12	26.86	84	10.73	\$10,317,983	\$10,250,155	6/85	de Burlo Group
Revere	103	12.02	101	14.44	96	09.65	\$15,868,805	\$15,996,151	5/85	* Fort Hill
Salem	62	17.00	79	19.46	41	14.58	\$20,336,314	\$20,406,553	4/85	Shawmut Bank of Boston
Saugus	100	13.00	100	14.52	78	11.50	\$7,374,760	\$7,427,425	7/86	PRIM Board
Shrewsbury	45	18.30	91	17.28	8	19.34	\$8,605,742	\$8,792,703	2/85	* PRIM Board
Somerville	8	21.24	3	29.93	59	13.13	\$36,134,667	\$36,573,455		* Alex Brown
Southbridge	28	19.91	27	23.89	25	16.06	\$3,424,601	\$3,452,356		
Springfield	51	17.65	63	20.45	38	14.91	\$71,186,917	\$69,395,184	5/85	* BayBank Inc.
State Employees'	24	20.05	22	24.07	23	16.16	\$2,523,385,334	\$2,298,380,050	12/83	* Multiple Advisors
Stoneham	26	19.98	30	23.68	22	16.38	\$10,183,107	\$10,191,873	7/85	David L. Babson
Swampscott	34	19.10	7	27.95	83	10.86	\$5,292,671	\$5,355,820	3/85	de Burlo Group
Taunton	5	21.73	33	23.41	5	20.06	\$19,539,318	\$19,746,356	6/85	U.S. Trust Company
Teachers'	27	19.95	25	24.00	27	16.03	\$2,670,328,759	\$2,292,163,422 *	12/83	* Multiple Advisors
Wakefield	17	20.43	74	19.75	3	21.12	\$11,820,517	\$11,931,503	7/85	PRIM Board
Waltham	33	19.39	49	22.19	17	16.65	\$32,494,295	\$31,873,016	2/85	BayBank Inc.
Watertown	76	15.99	72	19.89	74	12.22	\$15,201,124	\$17,364,096	3/85	Boston Company
Webster	69	16.54	75	19.71	53	13.46	\$2,887,267	\$2,911,303		* Alex Brown
Wellesley	20	20.30	39	22.74	10	17.92	\$19,143,808	\$18,801,901	2/85	Standish, Ayer & Wood
W. Springfield	99	13.47	98	15.78	81	11.20	\$8,666,400	\$9,473,647	2/86	Shawmut First Bank & Trust
Westfield	46	17.91	65	20.28	32	15.60	\$15,584,508	\$15,453,463	4/85	Bank of New England-West
Weymouth	3	24.04	6	28.18	6	20.02	\$18,681,301	\$20,156,164	10/84	PRIM Board
Winchester	35	18.96	37	22.77	35	15.26	\$11,159,638	\$10,570,688	5/86	Tucker Anthony & R.L. Day
Winthrop	68	16.58	87	18.51	40	14.68	\$5,688,278	\$5,394,719	3/85	Constitution Capital Mgmt.
Woburn	1	26.95	1	32.45	2	21.68	\$15,307,741	\$14,548,534		
Worcester City	52	17.52	83	19.26	28	15.81	\$92,959,188	\$93,874,305	5/86	* Multiple Advisors
Worcester Co.	6	21.43	11	27.07	26	16.04	\$72,283,928	\$72,494,065		

TABLE #1 SYSTEM PERFORMANCE

Table #1 Indicates:

The 1985-1986 annualized time-weighted rate of return of each system and the system's ranking;

The 1985 time-weighted rate of return of each system and the system's ranking;

The 1986 time-weighted rate of return of each system and the system's ranking;

The December 31, 1986 asset value of the system at both book value (as reported by the system on its Annual Statement for the year ending December 31, 1986, with fixed income investments valued at their original cost adjusted for an accretion of discount or amortization of premium as required by statute) and fair market value;

The date, if any, that the system was exempted from the statutory investment restrictions as authorized by Chapter 66I and/or the date the system joined the PRIT Fund; and

The Investment Advisor for each system as listed on the Annual Statement filed by the system.

Measuring performance by time-weighting is the standard method by which the investment community compares performance. Time-weighting insulates performance calculations from changes in portfolio value that occur because of the timing and amount of cash flow. Time-weighting thus allows the comparison of the performance of portfolios which differ in the timing of cash flows over which the manager who makes investment decisions has no control. This method allows a fair measurement of the effectiveness of the investment decisions of the fund manager.

Table #1 lists the 1985-1986 annualized performance and the 1986 performance of the 106 retirement systems as well as the Pension Reserve Investment Trust (PRIT) Fund. The 106th Massachusetts Contributory Retirement System, created in 1985 for employees of the Massachusetts Water and Sewer Authority, was not in existence on January 1, 1985, therefore, performance for this system for 1985 is not included in this report. Annualized performance data for this system is since the system's inception on July 1, 1985.

This report on the 1986 performance of the State Employees' and Teachers' Retirement Systems includes Pension Reserve Funds of these two systems managed by the PRIM Board which were not included in PERA's report on 1985 performance. Inclusion of the reserve funds increased the two year annualized return for these systems by 70 and 55 basis points, respectively. Differences between PERA's report and the PRIM Board's report of 1986 PRIT Fund performance are due to data adjustments described in this report and to differences in the frequency of valuations and linking periods used in calculating the time-weighted returns.

Market values reflect the December 31, 1986 fair market value of each portfolio. (It should be noted that the valuation of the PRIT Fund includes the eleven local retirement systems which were participating in the pooled fund as of December 31, 1986.)

(*) The annual statement of financial condition due May 1, 1987, had not been received as of October 1, 1987 for the Gloucester, Lexington, Massachusetts Housing Finance Agency and Teachers' Retirement Systems. December 31, 1986 book values for these systems thus reflect PERA's best estimate. The book value for the PRIT Fund, which is not subject to the statutory amortized book valuation, is represented at its market value.

Following Table #1 is:

Appendix I-A describing certain data adjustments utilized in evaluating the performance of the systems listed in Table #1;

Appendix I-B explaining footnoted (*) listings for Investment Advisors, and listing the multiple advisors for systems having same;

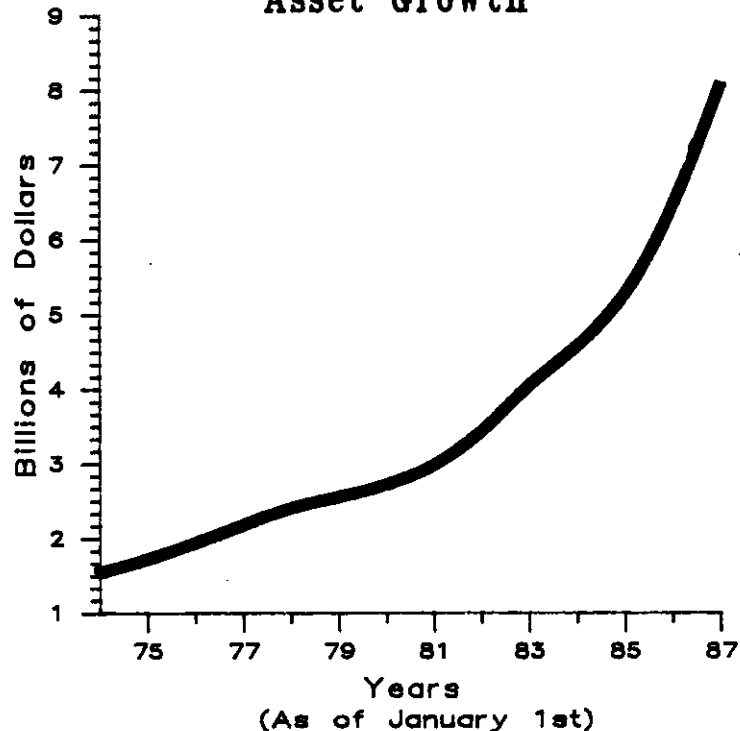
Appendix I-C listing Investment Advisors managing three or more retirement systems; and

Appendix I-D indicating the number of systems receiving investment waivers or joining the PRIT Fund by month from October, 1984 to date.

Massachusetts Pension System Asset Growth

Asset Growth

The combination of the State government's Pension Reserve appropriations, the improved investment returns achieved under the prudent person standard, and the retention of all investment income in local systems' Pension Reserves under the provisions of Chapter 66I, has resulted in an acceleration of the growth of the Commonwealth's pension assets. On January 1, 1984, the systems' assets totalled \$1.552 billion. It took eight years for these assets to double, reaching \$3.413 billion on January 1, 1982. In the next five years (three of which were under Chapter 66I), the assets more than doubled, growing to \$8.082 billion on January 1, 1987.



Comparative Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans, and to standard investment indices, the following table lists the rate of return for a number of comparative standards as described here and the ranking that such standard would receive if integrated with the 107 systems ranked in Table #1:

* The SEI Balanced Fund Return represents the median performance of all balanced funds monitored by SEI Associates, 90 percent of which are corporate tax-exempt funds, and 10 percent of which are state and local government retirement systems, other trusts, profit-sharing plans and endowments.

* The SEI State Government Return represents the median performance of the statewide retirement systems from across the country monitored by SEI Associates.

* The SEI Local Government Return represents the median performance of the city and town retirement systems from across the country monitored by SEI Associates.

* Composite Index consisting of 70% of the Shearson Lehman Government/Corporate Bond Index and 30% of the S&P Stock Index, which is similar to the basis of the rate of return objective for each system established in PERA's investment regulations. (The PERA regulations have been amended, as of August 1987, to use the Shearson Lehman Government/Corporate Bond Index

cited here, rather than the Salomon Brothers High Grade Long Term Bond Index. In 1986, the Salomon Brothers Index was significantly higher than the Shearson Lehman Index.)

* Massachusetts Aggregate for 1986 performance represents the combined performance of the 106 retirement systems' portfolios. In computing the aggregate, the performance of the PRIT Fund itself was not included since its performance is accounted for in the portfolios of the individual participating and purchasing systems.

* Aggregate Composite Index for 1986 performance represents a composite index including 30.83% of the S&P Stock Index, 59.11% of the Shearson Lehman Government/Corporate Bond Index, and 10.06% of the U.S. Treasury Index, which represents the actual asset mix of the 106 aggregate systems as of December 31, 1986. The actual asset mix of the PRIT Fund was substituted for shares of the PRIT Fund for the systems owning shares of the PRIT Fund; the actual asset mix of the Treasurer's Fixed Income Securities Trust (TFIST) and Treasurer's Management Trust (TMT) was substituted for shares of TFIST and TMT owned by the State Employees' and Teachers' systems.

<u>Standard of Comparison</u>	<u>1985-1986 Annualized Time Weighted</u>	<u>Ranking</u>	<u>1986 Time Weighted</u>	<u>Ranking</u>
SEI Balanced Funds	20.30	20	15.60	32
SEI State Government Funds	19.10	34	15.40	33
SEI Local Government Funds	19.20	34	14.90	39
70/30 Composite Index	20.46	17	16.55	20
Massachusetts Aggregate	18.95	36	15.64	32
Aggregate Composite Index	18.25	46	16.37	23

APPENDIX 1-A

Data Adjustments

The data adjustments which were made on specific portfolios are as follows:

Boston: An unreconciled cash contribution was made equal to .55% of the fund.

Brookline: This Division was unable to gain sufficient information from the system to verify the December 1986 cash as reported on the Trial Balance and cash as reported on the Annual Statement. Additionally, these two cash balances differed. An unreconciled cash contribution of \$33,000 was made assuming cash as reported on the Annual Statement to be correct.

Everett, Fall River, Quincy: Bank Statements and/or Annual Statements were used to track the investment activity of these systems rather than cash books and monthly trial balances.

Gloucester: An unreconciled cash withdrawal was made for \$4000. This withdrawal was made based on an unaudited cash balance.

Lexington: Cash as reported on the December 1986 Trial Balance differed from cash as reported on the Annual Statement. No adjustment was made.

MHFA: Annual interest earned on cash equivalent investments was accounted for over 12 months. Interest was reinvested at year end. An unreconciled cash contribution was made for \$8000; this contribution was made based on an unaudited cash balance.

Mass Turnpike: An unreconciled cash contribution was made for \$2000.

Norfolk County: An unreconciled cash withdrawal was made for \$14,000.

PRIM Board: An unreconciled cash withdrawal was made equal to .9% of the fund.

Worcester: An unreconciled cash withdrawal was made for \$4000.

APPENDIX I-B

Investment Advisor Footnotes (*) and Multiple Advisor Listings

(*) Those managers of systems who have qualified to manage under a "waiver" from the "legal list" restrictions are listed in Table #1. Six retirement systems who have not received waivers indicated on their annual statement the name of an investment advisor. Beverly, Clinton, Maynard, Somerville and Webster listed their investment manager as Alex Brown. The Dedham Retirement System listed Aetna as its manager.

Boston	Multiple Advisors	Thorndike, Doran, Paine & Lewis Capitol Bank Eagle Asset Mgmt. Boston Company Bear Stearns, Inc. Warburg Investment Mgmt. International Ltd. Oechsle International Advisors
Braintree		(*) The system received its original "legal list" waiver on April 1, 1985 with the Shawmut Bank of Boston as investment advisor. On September 9, 1986 the system changed its investment advisor. Drexel Burnham Lambert has served Braintree as investment advisor since September 9, 1986.
Concord	Multiple Advisors	Constitution Capital Management Frank Russell Trust Company
Gardner		(*) The system received a "legal list" waiver on May 21, 1985 with the Shawmut Bank of Boston as investment advisor. On December 1, 1986 Gardner transferred into the PRIT Fund.
Hampden County		(*) The system received its original "legal list" waiver on April 11, 1985 with Rollert & Sullivan as its investment advisor. The waiver was revoked on July 31, 1985 when the system terminated its investment advisor. A new waiver was granted on August 16, 1985 with the Boston Company as investment advisor.
Holyoke	Multiple Advisors	Tucker Anthony Management Company David L. Babson Company Internal - Ray DePelteau Leonard Management Group
Lowell		(*) The "legal list" waiver was revoked on November 13, 1985.
Middlesex County	Multiple Advisors	Constitution Capital Management Boston Company Putnam Advisory Company Oppenheimer Capital
Montague		(*) The system received a "legal list" waiver on March 5, 1986 with Gardner & Preston Moss, Inc. as investment advisor. On July 1, 1986 Montague transferred into the PRIT Fund.
Needham		(*) The system received a "legal list" waiver on March 12, 1985 with Fort Hill as investment advisor. On July 1, 1985 Needham transferred into the PRIT Fund.
New Bedford		(*) The system received its original "legal list" waiver on August 2, 1985 with Shawmut/Bristol County as investment advisor. On October 9, 1986 New Bedford withdrew its waiver and is now investing under the "legal list" standard.
Newton		(*) The system received its original "legal list" waiver on March 4, 1985 with Standish, Ayer as investment advisor. On March 19, 1987 Newton changed its investment advisor to the following investment advisors: Multiple Advisors Boston Company Drexel Burnham Lambert Loomis, Sayles & Company Tucker Anthony Management Company
Pittsfield	Multiple Advisors	DeBurlo Group Internal - Lawrence Grizey
Plymouth County		(*) The system received a partial waiver from the "legal list" restrictions allowing 50% of the portfolio to be invested under a "prudent person" standard rather than under the "legal list" limitations.

Revere	(*) The system received a partial waiver from the "legal list" restrictions on May 14, 1985 with Fort Hill as investment advisor. On March 27, 1987 Revere received a full waiver with Fort Hill continuing as their investment advisor.	
Shrewsbury	(*) The system received a "legal list" waiver with BayBank as the system's investment advisor. On July 1, 1985 Shrewsbury transferred into the PRIT Fund.	
Springfield	(*) The system received its original "legal list" waiver on May 6, 1985 with the Bank of New England - West as investment advisor. Springfield has changed its investment advisor to BayBank, Inc. and its Application for Exemption from Investment Restrictions is currently on file with PERA.	
Worcester	Multiple Advisors	Trident Investment Management Frank Russell Trust Company Mechanics Bank Guaranty Bank

The State Employees and Teachers Retirement Systems hold units in two trusts managed by the State Investment Committee: the Treasurer's Management Trust (TMT) for equities and the Treasurer's Fixed Income Securities Trust (TFIST) for fixed income investments. The advisors for the respective trusts are as follows:

TMT	Eaton Vance Management Gardner & Preston Moss Hagler Mastrovita & Hewitt Independence Investment Associates Investco Capital Management One Federal Asset Management Ruggels & O'Neill Associates Standish, Ayer & Wood State Street Bank State Street Research & Management Stein Row & Farnham Thorndike Doran Paine & Lewis Trinity Investment Management Wells Fargo Investment Advisors First Chicago Investment Advisors Lendorff & Babson Aldrich Eastman & Walitch/State Street Bank Real Estate Fund Clayton & Dubilier Associates John Hancock Venture Capital Management TA Associates Vista Ventures Copley Real Estate Advisors, Inc. Welsh, Carson, Anderson & Stowe New Enterprise Associates Beta Ventures, Inc. Frontenac Venture Co. Narragansett Capital, Inc.	
TFIST	Fiduciary Trust Company International Gardner & Preston Moss Miller Anderson Scerrerd Pacific Investment Management Company Standish, Ayer & Wood State Street Research & Management Pension Investment Division of the State Treasury Baring America Asset Management Company WR Lazard & Co., Inc. Loomis, Sayles & Co., Inc.	
PRIM Board	Multiple Advisors	Alliance Capital Baring International Bear Stearns Boston Company Lazard Freres N.M. Rothschild Schroeder Capital Management Scudder, Stevens & Clark

State Street International
Trinity
U.S. Trust
Warburg Investment
Wright Investors
Baring America
Lehman Management Co., Inc.
One Federal Asset Management
Putnam Advisory Company
Sass Investors
Internal - PRIM Staff

Real Estate

Bank of Boston
Boston Financial Group
Copley Real Estate Advisors
John Hancock Property Investors Corp.
Heitman Advisory Corp.
J.M.B. Institutional Realty Corp.
Trust Company of the West
American Investment Team
Aldrich Eastman & Walch
Lomas & Nettleton

Venture Capital

Davis Venture Partners
John Hancock Venture Capital Management, Inc.
Southern California Ventures
Venture Capital Fund of New England
Vista III Limited Partnership
Forstmann Little
Kohlberg, Kravis & Roberts

APPENDIX I-C

Investment Advisors Managing Multiple Systems

<u>Investment Advisor</u>	<u>Number of Systems Managing</u>	<u>Systems Under Management</u>
PRIM Board	12	Fairhaven Gardner MHFA Milton Minuteman Regional Montague Needham Norfolk Cty. Saugus Shrewsbury Wakefield Weymouth
de Burlo Group	11	Belmont Bristol Cty. Franklin Cty. Lynn Malden Marblehead North Adams Northampton Pittsfield Reading Swampscott
Constitution Capital	8	Arlington Concord Hingham Medford Melrose Middlesex Cty. Norwood Winthrop
Tucker Anthony Mgmt Co. *	6	Chicopee Essex Cty. Gloucester Holyoke Newton Peabody
Boston Company	6	Boston Hampden Cty. Haverhill Middlesex Cty. Newton Watertown
BayBank Inc. *	5	Attleboro Everett Fall River Springfield (pending) Waltham
David L. Babson	4	Blue Hills Holyoke Methuen Stoneham
Shawmut Bank	4	Athol Northbridge Salem West Springfield

Bank of New England - West

3

Greenfield
Hampshire Cty.
Westfield

(*) Tucker Anthony: In the 1985 Report, Winchester's investment advisor was noted as Tucker Anthony Management Company. Winchester has been managed since May 6, 1986 by Tucker Anthony/R.L. Day, Inc., which differs from the Tucker Anthony Management Company.

(*) BayBank: Springfield was managed by Bank of New England-West until September 1987. A waiver request with BayBank Inc. as Investment advisor is currently on file with PERA.

APPENDIX I-D

Legal List Waivers/PRIT Participation by Month

<u>Month</u>	<u>Number of Systems Waived</u>	<u>Number Joining PRIT</u>	
December 1983	2		State Employees' and Teachers' systems waived from "legal list" by Chapter 661 of the Acts of 1983.
October 1984		1	
February 1985	6		One of which joined PRIT in July 1985.
March	17		One of which joined PRIT in July 1985.
April	18		
May	6		
June	4		One of which was revoked on November 13, 1985.
July	4	4	
August	2		One of which was withdrawn on October 9, 1986.
November		1	
December	2		
January 1986	1		
February	1		
March	1		This system joined PRIT in July 1986.
May	3		
June	2		
July	2	4	
October	1		
December	2	1	The system joining PRIT was formerly waived in May 1985.
February 1987	1		
March	1		
June		1	

As of this Report

68 systems	Are investing pursuant to a "legal list" waiver from PERA.
2 systems	Are investing pursuant to a statutory "legal list" waiver (State Employees' and Teachers' Systems).
12 systems	Are participating in PRIT.
2 systems	Were waived at one time but now are investing with "legal list" restrictions.
22 systems	Continue investing on the "legal list" standard.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE
Annual & By Quarter

PAGE ONE

TABLE # 2

System	1986 Time Weighted		1986 First	Quarterly		Investment Third	Returns Fourth
	Rank	Return		Second			
Adams	102	09.14	04.80	02.03	01.30	00.76	
Amesbury	89	10.20	06.51	02.14	-00.86	02.17	
Andover	36	15.15	07.80	01.58	00.35	04.79	
Arlington	18	16.65	08.29	02.51	01.17	03.86	
Athol	94	09.82	04.50	02.22	-00.29	03.11	
Attleboro	63	12.91	07.13	01.80	-00.52	04.07	
Barnstable Co.	64	12.60	08.29	02.33	-00.63	02.34	
Belmont	97	09.59	08.26	04.99	-05.20	01.71	
Berkshire Co.	57	13.24	06.61	01.67	01.32	03.12	
Beverly	61	12.98	07.80	02.80	-02.07	04.10	
Blue Hills	54	13.35	06.37	01.85	01.09	03.50	
Boston	24	16.12	11.71	02.14	-01.51	03.33	
Braintree	21	16.40	08.77	01.55	00.60	04.76	
Bristol Co.	79	11.43	09.43	03.83	-03.53	01.66	
Brockton	67	12.46	09.72	01.55	-01.62	02.60	
Brookline	76	11.79	05.34	02.26	01.10	02.64	
Cambridge	16	16.70	10.93	02.07	00.18	02.87	
Chelsea	52	13.47	09.56	00.61	00.23	02.71	
Chicopee	87	10.53	04.48	01.48	-01.30	05.62	
Clinton	68	12.46	09.61	02.61	-01.62	01.63	
Concord	86	10.67	05.01	01.59	-00.08	03.82	
Danvers	92	09.83	06.90	01.85	-00.65	01.54	
Dedham	65	12.66	00.04	01.43	00.32	10.68	
Dukes County	85	10.68	06.68	03.36	-02.28	02.72	
Easthampton	46	14.06	09.42	01.97	-00.51	02.75	
Essex County	12	17.15	10.99	02.50	-02.53	05.66	
Everett	50	13.56	08.40	01.86	-00.94	03.83	
Fairhaven	95	09.67	04.77	02.13	-01.65	04.22	
Fall River	33	15.35	08.37	01.88	00.15	04.32	
Falmouth	71	12.41	05.66	01.55	01.90	02.81	
Fitchburg	70	12.41	06.13	01.99	00.73	03.10	
Framingham	49	13.57	06.46	02.39	01.06	03.09	
Franklin Co.	105	07.73	06.52	03.84	-03.59	01.02	
Gardner	62	12.94	07.00	01.84	00.61	03.02	
Gloucester	19	16.57	11.79	02.52	-03.87	05.81	
Gr. Lawrence	106	07.28	02.09	01.78	01.88	01.34	
Greenfield	58	13.19	05.64	01.58	02.42	02.99	
Hampden County	47	13.87	05.54	01.97	00.88	04.90	
Hampshire Co.	77	11.73	04.76	01.69	02.16	02.66	
Haverhill	14	16.79	09.18	01.78	01.22	03.84	
Hingham	34	15.32	06.22	01.41	01.97	04.99	
Holyoke	45	14.15	07.96	03.19	-02.01	04.57	
Hull	80	11.36	10.45	01.95	-02.97	01.92	
Lawrence	72	12.24	08.01	06.10	-06.35	04.58	
Leominster	73	12.22	06.35	02.07	01.01	02.34	
Lexington	31	15.67	09.21	02.91	-01.21	04.18	
Lowell	43	14.50	06.56	02.13	01.67	03.48	
Lynn	75	12.20	10.93	03.96	-04.79	02.19	
Malden	99	09.38	09.64	09.37	-10.04	01.40	
Marblehead	104	07.87	08.72	04.02	-06.28	01.78	
Marlborough	91	09.90	06.47	02.46	-01.27	02.05	
MHFA	98	09.39	02.38	02.16	02.11	02.43	
Mass Turnpike	13	16.90	09.17	01.40	01.69	03.85	

System	1986		1986 Quarterly Investment Returns			
	Time Weighted Rank	Return	First	Second	Third	Fourth
MWRA	107	05.78	01.55	01.53	01.35	01.23
MassPort	9	18.68	11.31	03.86	-00.41	03.08
Maynard	90	16.90	07.54	02.51	-01.49	01.21
Medford	37	15.13	08.34	02.82	00.53	02.80
Melrose	20	16.49	08.30	02.53	00.91	03.95
Methuen	51	13.50	07.68	01.37	01.52	02.43
Middlesex Co.	39	08.97	07.67	02.32	-00.16	04.45
Milford	103	08.97	04.35	03.93	-01.36	01.87
Milton	82	10.94	06.75	01.04	-01.46	04.37
Minuteman	1	22.05	14.17	03.56	-01.99	05.32
Montague	101	09.16	04.04	01.97	-01.40	04.35
Natick	42	14.56	09.14	03.28	-00.01	01.64
Needham	4	20.75	13.98	03.27	-01.78	04.45
New Bedford	48	13.68	09.54	02.27	-00.86	02.36
Newburyport	100	09.18	05.83	02.14	-01.28	02.31
Newton	44	14.33	08.02	01.82	00.65	03.28
Norfolk County	11	17.47	10.19	03.68	-01.67	04.57
North Adams	93	09.83	11.36	02.73	-05.02	01.09
North Attleboro	66	12.65	05.80	03.03	-00.96	04.35
Northampton	69	12.45	12.59	04.09	-05.21	01.22
Northbridge	88	10.34	05.39	01.80	-00.11	02.96
Norwood	56	13.30	04.79	04.30	00.02	03.64
PRIM Board	7	19.94	11.13	04.02	-01.66	05.51
Peabody	29	15.77	10.23	01.52	-01.50	05.03
Pittsfield	60	13.05	07.44	02.60	-00.23	02.79
Plymouth	30	15.73	07.75	01.69	01.08	04.49
Plymouth County	15	16.71	08.89	01.60	00.28	05.20
Quincy	55	13.31	07.29	02.91	-00.03	02.65
Reading	84	10.73	09.48	03.52	-04.10	01.88
Revere	96	09.65	07.74	01.65	-01.40	01.55
Salem	41	14.58	07.59	01.72	01.13	03.51
Saugus	78	11.50	05.22	01.79	00.17	03.93
Shrewsbury	8	19.34	12.52	03.09	-01.31	04.24
Somerville	59	13.13	11.35	03.41	-03.73	02.06
Southbridge	25	16.06	07.96	01.88	01.87	03.58
Springfield	38	14.91	06.89	02.92	00.14	04.31
State Employees'	23	16.16	09.89	02.35	-00.82	04.14
Stoneham	22	16.38	08.85	03.25	00.17	03.38
Swampscott	83	10.86	10.32	02.93	-03.16	00.82
Taunton	5	20.06	11.75	05.31	-02.13	04.25
Teachers'	27	16.03	09.92	02.10	-00.62	04.03
Wakefield	3	21.12	13.79	03.47	-01.58	04.53
Waltham	17	16.65	07.57	01.49	02.63	04.11
Watertown	74	12.22	07.39	00.15	00.15	04.19
Webster	53	13.46	08.63	03.33	-02.33	03.49
Wellesley	10	17.92	10.79	03.02	-00.65	03.98
W. Springfield	81	11.20	04.89	01.08	00.69	04.16
Westfield	32	15.60	08.16	04.19	-02.35	05.04
Weymouth	6	20.02	13.23	03.41	-01.90	04.49
Winchester	35	15.26	07.64	01.88	00.27	04.83
Winthrop	40	14.68	07.86	01.82	01.00	03.38
Woburn	2	21.68	13.94	01.03	-00.74	06.50
Worcester City	28	15.81	06.91	02.33	00.00	05.86
Worcester Co.	26	16.04	07.85	01.64	03.00	02.78

TABLE #2 SYSTEM PERFORMANCE BY QUARTER

Table #2 indicates:

The time-weighted rate of return and ranking of each system with the systems listed in alphabetical order; and

Quarterly investment returns for each system.

For retirement systems owning group annuity contracts and/or retirement plan funding agreements issued by insurance companies, these assets were carried at the December 31, 1986 market value. Where market values were supplied, the performance for these contracts/agreements is noted in the fourth quarter as part of the fixed income performance. Depending on the magnitude of the contracts/agreements, retirement system performance will be understated in the first, second and third quarters and overstated in the fourth quarter as a result of this procedure.

The Dedham Retirement System, with 94.35% of its assets in contracts/agreements, had performance of 0.04% in the first quarter; 1.43% in the second quarter; 0.32% in the third quarter and 10.68% in the fourth quarter. The Dedham System's annual performance, however, is not affected materially by the timing of the market value reappraisal of the contracts/agreements. No other system approaches Dedham's commitment to group annuity contracts/retirement plan funding agreements. The Worcester Retirement System with 24.34% of its assets in contracts/agreements did not provide market values for its contracts/agreements for 1985. The performance for this system for 1986 reflects the performance of the contracts/agreements for 1985 and 1986.

Systems participating in the PRIT Fund receive an additional dividend for their investment by way of their proportionate share of a state appropriation pursuant to Chapter 32, s.22B of the General Laws. The result of this dividend in 1986 significantly increased the quarterly performance, and the total annual performance, of the Minuteman, Needham, Shrewsbury, Wakefield, Weymouth, State Employees' and Teachers' retirement systems. The other system joining the PRIT Fund in late 1985 and the other four systems joining the PRIT Fund in 1986 received appropriations for the first and second quarter fiscal appropriations and the one system joining the PRIT Fund in late 1986 did not receive this participation dividend until Calendar Year 1987. Accordingly, its performance in 1986 is unaffected by any such dividend. The annualized performance of the Weymouth Retirement System reflects the dividend received by Weymouth in 1985. This state appropriation was accounted for as a contribution for the PRIT Fund itself.

Comparative Quarterly Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans and to standard investment indices, the following table lists the rate of return for the comparative standards described earlier in this report:

<u>Standard of Comparison</u>	<u>1986 Time Weighted Return</u>	<u>1986 Quarterly Investment Returns</u>			
		<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>
SEI Balanced Funds	15.60	10.73	03.98	-03.65	04.20
SEI State Government Funds	15.40	10.11	02.55	-01.64	03.90
SEI Local Government Funds	14.90	10.16	02.86	-02.50	04.00
70/30 Composite Index	16.55	10.19	02.70	-00.67	03.83
Massachusetts Aggregate	15.64	09.62	02.31	-00.75	03.90
Aggregate Composite Index	16.37	09.57	02.79	-00.80	03.67

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

TABLE # 3

SYSTEM PERFORMANCE Annual;
By Asset Class; Asset Allocation

PAGE ONE

System	1986 Time Weighted		Equity			Fixed Income		Cash	
	Rank	Return	Return	Beta	Allo- cation	Return	Allo- cation	Return	Allo- cation
Adams	102	09.14	04.43	0.44	36.06	13.54	48.96	05.28	14.98
Amesbury	89	10.20	13.48	0.97	25.01	13.22	52.34	06.55	22.64
Andover	36	15.15	12.53	1.38	05.32	16.43	87.31	07.05	07.37
Arlington	18	16.65	23.16	0.95	23.44	16.09	69.54	07.48	07.02
Athol	94	09.82	07.68	1.05	17.96	14.12	37.31	08.07	44.73
Attleboro	63	12.91	16.83	0.92	18.89	13.30	67.13	06.58	13.98
Barnstable Co.	64	12.68	13.98	0.70	19.24	14.89	76.94	08.47	03.82
Belmont	97	09.59	11.11	0.82	52.86	13.80	42.38	03.68	04.76
Berkshire Co.	57	13.24	18.06	0.92	09.10	16.18	55.16	08.84	35.74
Beverly	61	12.98	19.38	0.91	27.62	16.18	49.93	08.55	22.45
Blue Hills	54	13.35	20.33	0.96	17.44	15.14	66.07	06.70	16.49
Boston	24	16.12	18.61	0.77	24.71	17.39	56.30	07.44	18.98
Braintree	21	16.40	15.07	1.01	24.65	17.25	59.39	07.51	15.96
Bristol Co.	79	11.43	12.53	0.92	48.97	13.02	41.73	10.21	11.00
Brockton	67	12.46	08.99	0.98	21.53	16.47	54.79	06.53	23.68
Brookline	76	11.79	37.67	0.97	13.84	14.66	84.30	08.17	01.85
Cambridge	16	16.70	22.41	0.82	30.77	15.18	61.90	06.73	07.34
Chelsea	52	13.47	21.13	0.69	36.92	14.96	39.86	04.12	23.22
Chicopee	87	10.53	10.26	0.95	24.02	13.17	60.08	09.84	15.90
Clinton	68	12.46	13.51	0.96	30.23	15.37	47.10	06.41	22.67
Concord	86	10.67	-01.47	0.20	29.32	14.40	59.02	07.70	11.66
Danvers	92	09.83	08.19	0.94	28.42	12.40	61.87	06.92	09.72
Dedham	65	12.66	00.00	0.00	00.00	12.66	94.70	10.94	05.30
Dukes County	85	10.68	17.62	1.00	28.01	11.13	45.14	05.79	26.85
Easthampton	46	14.06	09.66	1.00	23.40	18.84	52.47	06.64	24.13
Essex County	12	17.15	20.72	1.07	25.10	18.54	62.14	08.74	12.76
Everett	50	13.56	14.62	0.94	22.52	13.97	79.19	08.06	-01.71
Fairhaven	95	09.67	19.27	0.00	48.69	03.10	33.86	05.35	17.45
Fall River	33	15.35	17.78	0.97	17.72	16.50	67.36	08.72	14.92
Falmouth	71	12.41	-15.47	1.09	06.24	14.17	91.93	05.49	01.82
Fitchburg	70	12.41	13.16	0.75	17.46	15.37	48.02	09.06	34.52
Framingham	49	13.57	15.24	0.75	10.80	13.79	81.47	08.98	07.72
Franklin Co.	105	07.73	04.88	0.92	39.22	11.94	47.32	06.41	13.47
Gardner	62	12.94	12.75	0.00	45.32	19.55	31.30	06.81	23.38
Gloucester	19	16.57	20.96	1.04	36.89	16.71	60.47	09.74	02.64
Gr. Lawrence	106	07.28	00.64	1.13	12.54	05.19	11.91	06.90	75.55
Greenfield	58	13.19	19.31	1.04	07.42	13.16	65.22	06.76	27.36
Hampden County	47	13.87	26.63	1.14	12.10	13.70	65.38	08.08	22.53
Hampshire Co.	77	11.73	11.48	0.00	00.00	14.43	60.86	07.32	39.14
Haverhill	14	16.79	27.36	1.21	09.77	19.18	67.81	07.69	22.43
Hingham	34	15.32	26.55	0.70	10.61	16.05	76.28	05.87	13.10
Holyoke	45	14.15	23.60	0.95	44.25	15.88	50.38	08.18	05.36
Hull	80	11.36	07.81	0.94	23.64	17.57	55.99	06.89	20.37
Lawrence	72	12.24	03.82	1.07	29.18	17.25	66.73	05.22	04.09
Leominster	73	12.22	16.32	0.95	20.71	17.46	40.50	06.88	38.79
Lexington	31	15.67	23.09	1.40	14.87	16.18	76.36	07.40	08.76
Lowell	43	14.50	36.08	0.96	12.35	15.72	57.06	07.01	30.59
Lynn	75	12.20	12.03	0.89	48.72	15.52	42.90	07.60	08.38
Malden	99	09.38	06.82	0.90	46.83	13.76	49.38	06.79	03.80
Marblehead	104	07.87	05.70	0.86	52.48	14.00	41.40	07.96	06.12
Marlborough	91	09.90	15.05	0.89	26.56	10.50	51.35	07.29	22.10
MHFA	98	09.39	10.14	0.00	00.76	11.30	04.11	09.29	95.13
Mass Turnpike	13	16.90	03.31	0.33	10.02	21.36	68.05	06.95	21.94

TABLE # 3

SYSTEM PERFORMANCE Annual;
By Asset Class; Asset Allocation

PAGE TWO

System	1986 Time Weighted		Equity			Fixed Income		Cash	
	Rank	Return	Return	Beta	Allo- cation	Return	Allo- cation	Return	Allo- cation
MWRA	107	05.78	00.00	0.00	00.00	00.00	00.00	05.78	100.00
MassPort	9	18.68	17.30	0.95	31.89	20.94	64.12	07.16	03.99
Maynard	90	09.92	13.41	0.88	30.36	11.19	38.63	05.31	31.01
Medford	37	15.13	22.90	0.91	21.87	15.11	61.86	09.18	16.27
Melrose	20	16.49	26.79	0.95	16.91	16.69	69.57	08.52	13.51
Methuen	51	13.50	15.69	1.23	13.28	14.27	77.75	05.99	08.97
Middlesex Co.	39	14.90	15.13	0.99	24.30	16.54	64.42	08.35	11.29
Milford	103	08.97	15.61	0.81	25.42	10.26	45.81	07.25	28.78
Milton	82	10.94	39.86	0.00	52.53	12.47	36.28	08.08	11.19
Minuteman	1	22.05	23.39	0.00	53.57	00.00	37.00	07.24	09.43
Montague	101	09.16	22.01	0.00	47.41	17.88	32.74	08.00	19.85
Natick	42	14.56	19.85	0.82	24.19	14.80	75.81	07.27	00.00
Needham	4	20.75	22.62	0.00	49.77	00.00	34.37	07.27	15.86
New Bedford	48	13.68	12.07	0.79	20.37	17.65	52.01	06.92	27.62
Newburyport	100	09.18	10.85	0.92	28.77	12.51	50.91	06.75	20.32
Newton	44	14.33	09.81	0.90	14.81	17.48	61.46	07.80	23.72
Norfolk County	11	17.47	18.62	0.00	51.54	02.48	35.59	10.00	12.87
North Adams	93	09.83	08.23	0.80	49.16	17.08	33.51	10.13	17.33
North Attleboro	66	12.65	16.28	0.52	49.53	12.46	23.21	06.41	27.26
Northampton	69	12.45	12.10	0.92	51.73	15.78	42.28	10.58	05.99
Northbridge	88	10.34	04.74	0.97	16.16	13.36	60.10	09.09	23.74
Norwood	56	13.30	14.43	0.80	27.72	14.54	63.85	07.40	08.42
PRIM Board	7	19.94	22.12	0.73	54.30	17.17	37.45	12.40	08.25
Peabody	29	15.77	20.66	1.05	33.88	17.14	67.73	07.42	-01.61
Pittsfield	60	13.05	20.58	0.92	25.77	16.57	51.48	07.75	22.74
Plymouth	30	15.73	04.90	0.90	07.40	16.67	87.20	00.21	05.41
Plymouth County	15	16.71	22.75	0.84	12.77	16.94	78.74	09.89	08.50
Quincy	55	13.31	20.62	0.76	26.30	13.94	70.02	08.36	03.68
Reading	84	10.73	07.60	0.92	39.71	15.86	55.48	09.48	04.80
Revere	96	09.65	06.29	0.96	12.66	20.09	24.70	07.45	62.63
Salem	41	14.58	23.63	1.02	04.00	17.65	66.13	06.30	29.87
Saugus	78	11.50	02.57	0.00	40.55	45.98	28.00	07.40	31.45
Shrewsbury	8	19.34	22.89	0.00	45.44	00.00	31.38	07.52	23.17
Somerville	59	13.13	15.34	0.88	53.64	14.77	42.93	08.02	03.43
Southbridge	25	16.06	30.54	0.54	20.14	15.95	49.01	07.07	30.84
Springfield	38	14.91	28.28	0.98	17.85	15.36	54.05	06.86	28.10
State Employees'	23	16.16	14.78	0.25	38.28	15.94	56.66	05.40	05.06
Stoneham	22	16.38	22.30	1.04	22.19	16.52	58.17	07.44	19.63
Swampscott	83	10.86	07.33	0.91	38.77	14.56	50.96	08.50	10.27
Taunton	5	20.06	29.49	0.99	37.04	18.05	52.35	04.48	10.61
Teachers'	27	16.03	14.50	0.26	34.50	15.94	62.49	05.90	03.01
Wakefield	3	21.12	22.50	0.00	52.20	00.00	36.05	09.91	11.76
Waltham	17	16.65	15.00	0.94	19.37	17.55	74.89	10.36	05.74
Watertown	74	12.22	30.39	1.18	16.90	08.41	65.87	06.06	17.24
Webster	53	13.46	19.31	0.91	30.86	12.36	46.83	11.94	22.32
Wellesley	10	17.92	14.58	0.85	56.99	23.46	38.31	05.29	04.70
W. Springfield	81	11.20	-00.63	1.02	13.72	12.86	79.39	12.01	06.89
Westfield	32	15.60	28.43	1.07	22.71	16.50	52.58	07.13	24.72
Weymouth	6	20.02	24.75	0.00	51.46	00.00	35.54	06.02	12.99
Winchester	35	15.26	25.55	1.03	13.04	17.55	66.90	06.58	20.06
Winthrop	40	14.68	22.16	0.98	19.12	15.72	59.42	06.24	21.46
Woburn	2	21.68	15.81	0.70	09.17	22.57	88.03	10.21	02.80
Worcester City	28	15.81	21.80	0.79	15.45	17.66	65.21	07.31	19.35
Worcester Co.	26	16.04	26.55	0.75	19.67	14.47	66.75	07.60	13.58

TABLES #3 SYSTEM PERFORMANCE BY ASSET CLASS

Table #3 Indicates:

- The 1986 time-weighted rate of return and ranking of each system listed in alphabetical order;

The annual return on the equity portion of the retirement system's portfolio which includes common and preferred stock;

The December 31, 1986 Beta for the equity portion of the retirement system's portfolio;

(Beta is an investment concept which evolved from linear regression analysis, where it measures the slope of expected values, or rather, the percentage volatility of a particular stock. This measure examines the riskiness of an individual stock by comparing its price volatility with that of the overall market. In this analysis, a Beta factor of 1.0 is assigned to the S&P 500 Index, and the price volatility of individual stocks relative to the overall market price fluctuations of the index determines the Beta of the individual security. Thus, if the price movements on a day-to-day basis for a given stock are 50% wider than the S&P 500 Stock Index price movements, the individual stock's Beta would be 1.5. On the other hand, a lower volatility stock might have a market Beta of 0.75, meaning its day-to-day price movement is only three-quarters that of the overall market index. Investment theories suggest that risk is compensated by higher returns; and that over time, high Beta stocks should be rewarded by higher returns. With the potential for higher returns, however, comes the higher risk, particularly in down markets. PERA's investment regulation requires that systems exempt from the "legal list" not exceed an annual average Beta of 1.15 for the equity portion of the board's portfolio.)

The December 31, 1986 percentage of the retirement system's portfolio invested in equities;

The annual return on the fixed income portion of the portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements;

The December 31, 1986 percentage of the portfolio committed to fixed income securities and group annuity contracts/retirement plan funding agreements;

The annual return on cash which includes cash and cash equivalent investments; and

The December 31, 1986 percentage of the retirement system's portfolio committed to cash.

The asset allocation for retirement systems continuing to operate within the statutory "legal list" allows such systems to invest:

In Fixed Income obligations of the U. S. Government and its agencies;

Up to 20% in fixed income obligations of railroad corporations;

Up to 35% in fixed income obligations of telephone companies;

Up to 50% in the fixed income obligations of public service companies;

Up to 15% in fixed income obligations of other corporations;

Up to 25% in equities of bank and insurance companies;

In money market funds;

In certificates of deposit; and

In group annuity contracts and/or retirement plan funding agreements issued by insurance companies.

Retirement systems which have been authorized by PERA to invest without being subjected to the "legal list" restrictions, must meet asset allocation guidelines set by PERA as follows:

Up to 40% in equity investments;

75% of equity investments must be in companies with \$100 Million in outstanding equity. Not more than 5% of equity investments may be in any one company;

Equities must be traded on U. S. Stock Exchange or over the counter;

Turnover of the equity portfolio is limited to 50% per year;

Real estate investments are included within the 40% of the portfolio committed to equity and may not exceed 5% of the portfolio; and

Venture Capital falls within the 40% allocation to equity and is limited to 3% or 5% of the portfolio depending on the size of the retirement system.

Between 40 and 80% of the portfolio is to be allocated to fixed income investments:

Fixed income securities must have a minimum quality rating of BAA;

75% of fixed income securities must be rated A or better;

No more than 5% of the portfolio may be invested in the fixed income obligations of any one company;

Fixed income investments shall only be made in issues with an outstanding par value of \$50 Million at the time of purchase; and

Turnover of fixed income investments is limited to 100%.

Up to 40% of the portfolio in Cash and Cash Equivalent Investments:

Money market funds;

Commercial paper;

Certificates of deposit; and

Repurchase agreements.

PERA regulations authorize retirement systems to invest pursuant to supplementary regulations which authorize investments other than those outlined here.

Systems joining the PRIT Fund hold shares of the PRIT Fund (which are treated as equities in PERA's monitoring system) and cash and cash equivalent investments authorized under the statutory "legal list".

The Minuteman, Needham, Norfolk County, Shrewsbury, Wakefield, and Weymouth Retirement Systems hold shares of the PRIT Fund, however, the asset allocation indicated in Table #3 reflects the asset allocation of the PRIT Fund itself. The equity performance as indicated in the table includes the fixed income performance of these portfolios as well. The fixed income performance of the Norfolk County Retirement System reflects two contracts/agreements transferred to the PRIT Fund in March 1986. The equity beta of zero reflects the volatility of the units against the market index.

The Fairhaven, Gardner, Milton, Montague, and Saugus Retirement Systems hold shares of the PRIT Fund, however, the asset allocation indicated in Table #3 reflects the asset allocation of the PRIT Fund itself. The equity performance as indicated in the table includes the fixed income performance for these systems once the systems transferred into the PRIT Fund. The fixed income performance represents the performance of the fixed income portfolio prior to transfer into the PRIT Fund. The equity beta of zero reflects the volatility of the units against the market index.

For the PRIM Board, no beta was calculated for international equity holdings. A zero beta was included in the calculation of the portfolio beta for these securities, thereby, understating the portfolio beta.

The State Employees' and Teachers' Retirement Systems hold shares of the Treasurer's Fixed Income Securities Trust, the Treasurer's Management Trust (an equity trust) and the PRIT Fund, however, the asset allocation as indicated in Table #3 represents the actual asset allocation of these funds. The equity performance as indicated in the table reflects the performance of the Treasurer's Management Trust, as reported by Massachusetts Fiduciary Advisors, Inc. as well as the PRIT Fund. The fixed income performance reflects the performance of the Treasurer's Fixed Income Securities Trust as reported by Massachusetts Fiduciary Advisors, Inc.

The Somerville Retirement System, investing pursuant to the "legal list", had been notified by this Division that it exceeded the permissible holdings in equities. That system has indicated that corrective action has been taken and is in compliance with the "legal list" investment requirements.

Asset Allocation

The single most important investment decision made by the board of any system is the allocation of the portfolio to different asset classes and the prompt investment of new funds according to that allocation.

The following is borrowed from a recent column by Jane Bryant Quinn:

"...careful "asset allocation" which--simply put--means deliberately dividing your money among stocks, bonds, cash and other types of investments. According to a study by the First National Bank of Chicago, asset allocation is the long-run determinant of your investment success or failure, not how smart (or dumb) you are in picking particular stocks or mutual funds.

But the moral is more than "diversify to protect your rear." The key to this strategy is continually returning to the original division among stocks, bonds and cash to limit your risk.

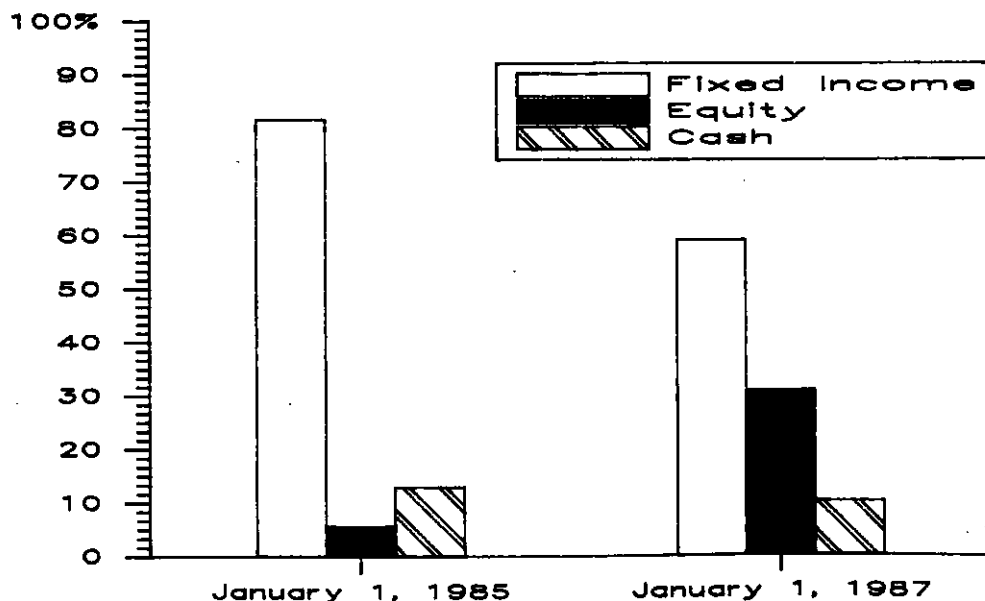
Most investors keep more and more of their money in stocks as the market rises, which makes their positions ever-more dangerous. When the bear strikes, they have more to lose.

Conversely, they are afraid to buy when times are bad, so they lose their chance to get stocks cheap. That's another beauty of keeping your stock and bond investments as a fixed ratio: It combats those bad-timing impulses that cost you money."

An analysis of the tables that appear in this report clearly shows that those systems which had extensive holdings in cash or cash equivalents (checking accounts, savings accounts, money market funds, commercial paper, certificates of deposit or repurchase agreements) performed poorly in comparison to those systems who quickly put their funds to work in equities or fixed income securities. Some systems made a conscious (even if, ultimately erroneous) choice in favor of cash and against equity and fixed income securities. Other systems with large cash holdings are victims of poor planning and management that did not get funds promptly invested. There is a correlation between cash allocations and performance--the greater the cash allocation, the poorer the performance.

Consistent with the professionalization of retirement system investment management, with the importance of asset allocation, and with the restructuring of portfolios that took place as a result of the Chapter 661 freedom from the "legal list" investment decisions, a significant shift from fixed income securities to equities in the aggregate and in waived systems, and from cash into equities in "legal list" systems is apparent in the accompanying charts.

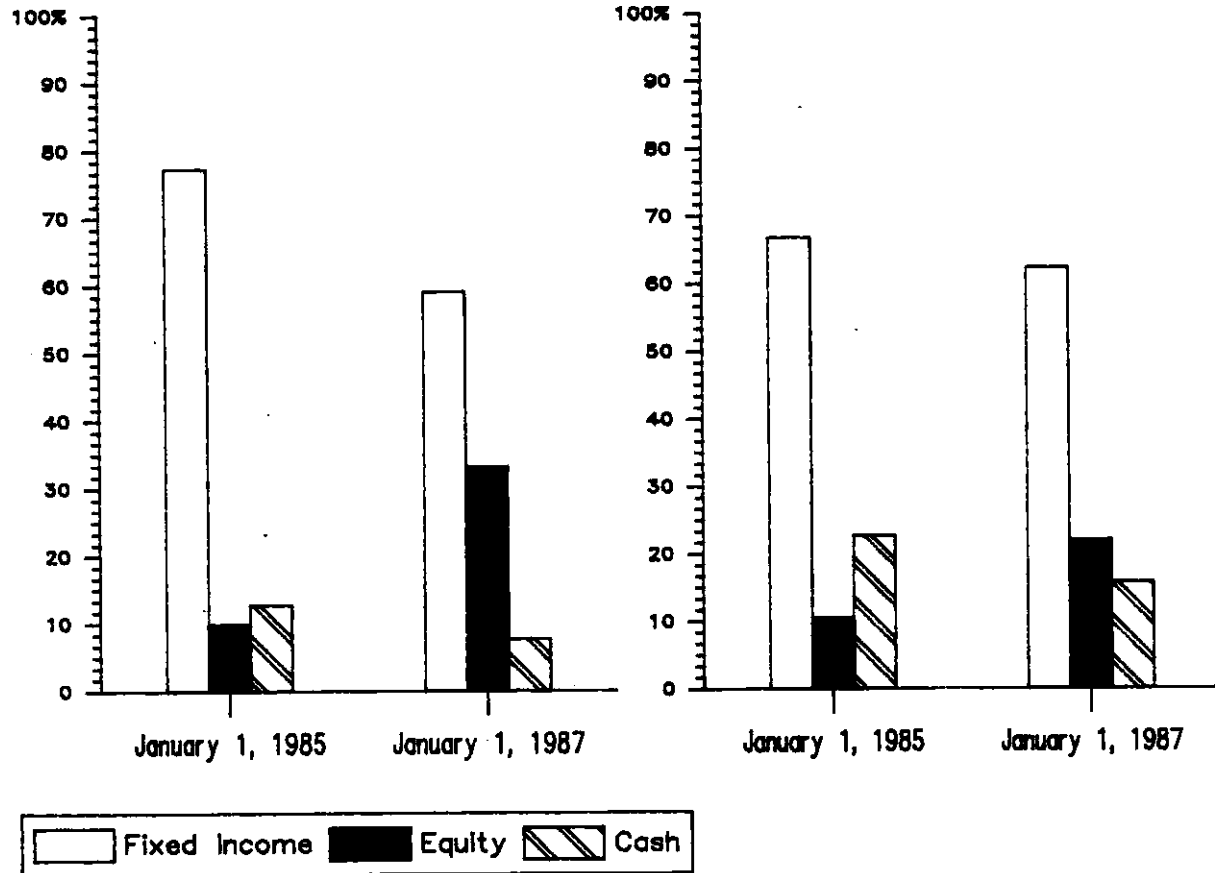
Asset Allocation Aggregate Systems



Asset Allocation

Exempt Systems

Legal List Systems

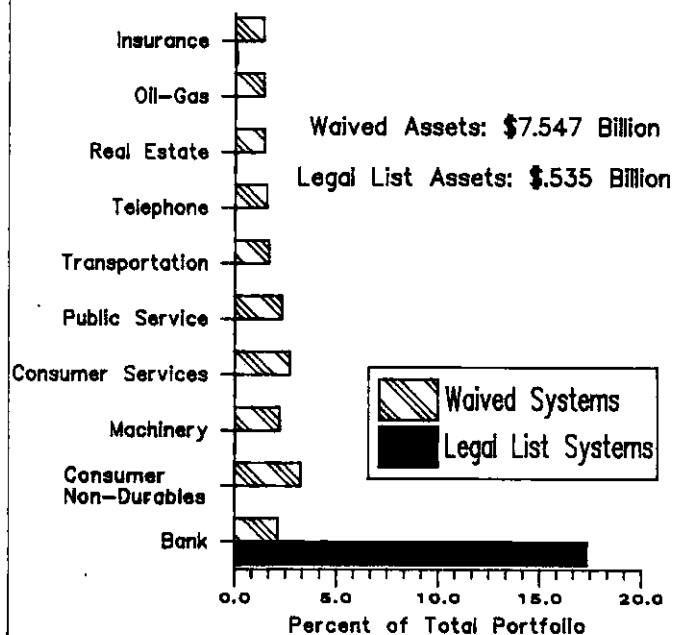


One of the other significant shifts in asset allocation has been the diversification of the systems' portfolios in a broad range of industries within each asset class. Particularly in equities, the "legal list" concentrated investment in a narrow range of regulated industries. As of January 1, 1987, these charts indicate that "legal list" systems had their entire equity exposure concentrated in bank stocks. This proved fortuitous in 1985, particularly as new laws allowing regional banking resulted in a run-up in the value of New England bank stocks. Over time, the broad diversification achieved by the waived systems will improve both the return and security of the investment portfolios.

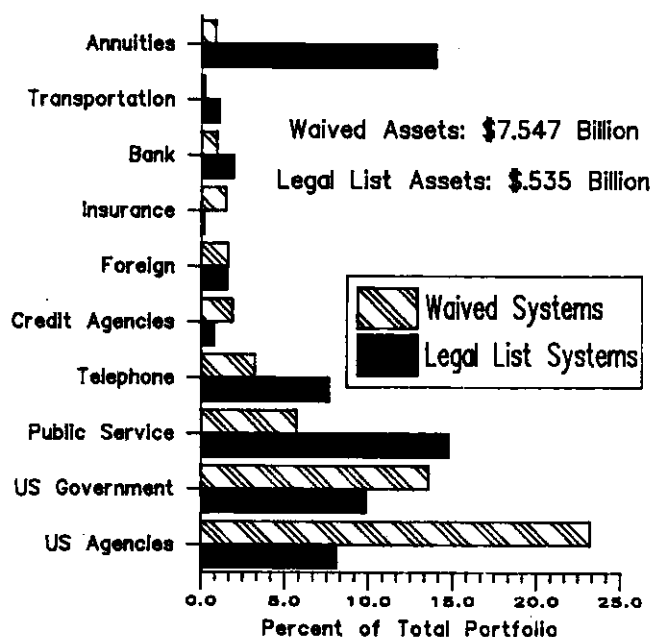
In the Fixed Income area there has been less of a difference in industry concentration. Perhaps the vagaries of the retirement statute in Massachusetts (which carries Fixed Income investments at amortized book values and further requires losses incurred when such securities are sold at market values below that amortized book to be made up through the appropriation process) partially explain the slower pace by which industry diversification is being achieved in the fixed income portfolios.

In the aggregate, the graphs show that broad diversification has been achieved in the equity allocation, while in the fixed income area, there remains a concentration in U.S. Government Agency and U.S. Government obligations.

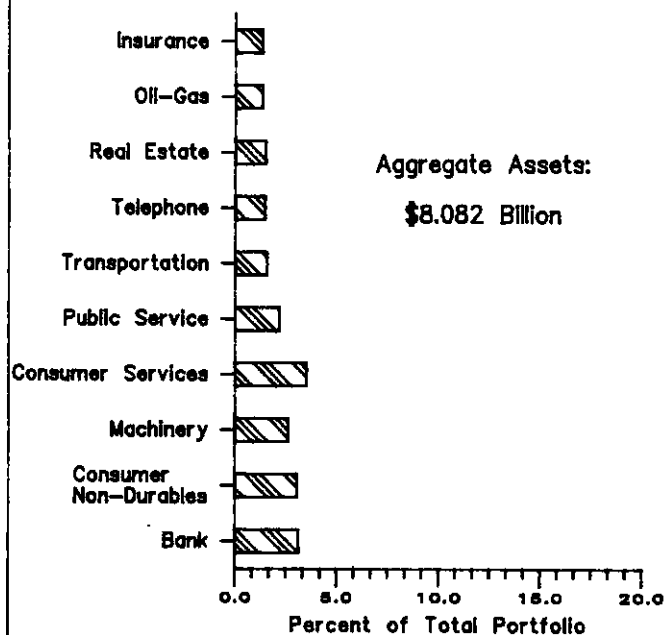
Equity Industry Diversification Waived vs Legal List Systems January 1, 1987



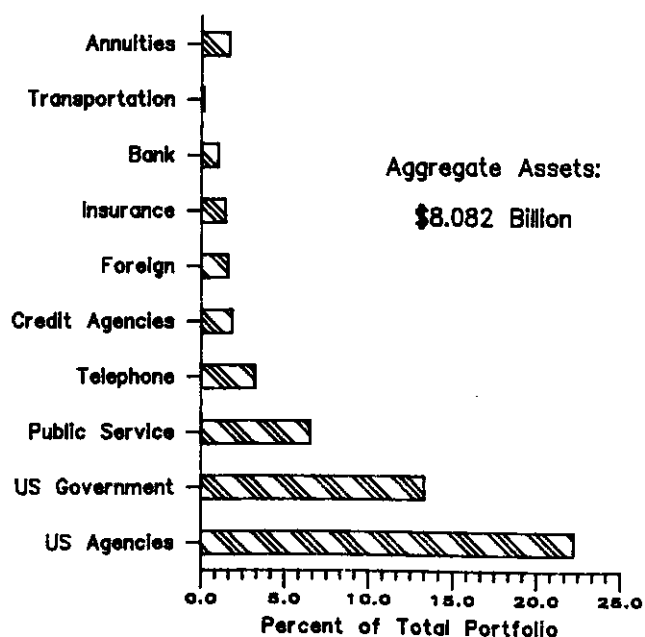
Fixed Income Industry Diversification Waived vs Legal List Systems January 1, 1987



Equity Industry Diversification Aggregate Systems January 1, 1987



Fixed Income Industry Diversification Aggregate Systems January 1, 1987



Comparative Asset Class Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans, and to standard investment indices, the following table lists the rate of return by asset class for the comparative standards described in the text accompanying Table #1:

<u>Standard of Comparison</u>	<u>Time-Weighted Rate of Return</u>	<u>Equity Return</u>	<u>Fixed Income Return</u>	<u>Cash Return</u>
SEI Balanced Funds	15.60	18.10	14.90	-
SEI State Government Funds	15.40	18.40	14.80	-
SEI Local Government Funds	14.90	16.90	15.40	-
S&P 500	-	18.75	-	-
Shearson/Lehman Bond Index	-	-	15.60	-
U.S. Treasury Bill Index	-	-	-	06.69
Massachusetts Aggregate	15.64	16.42	16.26	07.17

The Keefe, Bruyette and Woods Bank Index (which includes the stocks of money center institutions and large regional banks) showed a 1986 return of 10.59%.

Largest Holdings

Equities

Aggregate

<u>Security</u>	<u># Shares Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
Boston Five Cents Sv	351,550	\$11,776,925	.15
UST Corp	259,100	9,975,350	.12
Multibank Finl Corp	313,864	7,297,338	.09
Conifer Group Inc.	122,218	6,660,881	.08
First Service Bk Svg	621,000	5,278,500	.07

This list excludes shares owned of the Treasurer's Fixed Income Securities Trust Fund (30.78%), the PRIT Fund (22.05%), and the Treasurer's Management Trust Fund (12.41%).

Exempt Systems

<u>Security</u>	<u># Shares Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
Co-Operative Bank Concord	293,250	\$ 4,838,625	.06
Bristol Meyers Co.	59,150	4,887,268	.06
IBM	29,200	4,704,000	.06
Phillip Morris Co.	65,100	4,679,062	.06
Digital Equipment	43,266	4,532,113	.06

This list excludes shares owned of the Treasurer's Fixed Income Securities Trust Fund (32.96%), the PRIT Fund (23.60%), and the Treasurer's Management Trust Fund (13.29%).

Legal List Systems

<u>Security</u>	<u># Shares Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
Boston Five Cents Svgs	311,950	\$10,450,325	1.95
UST Corp	219,350	8,444,975	1.58
Multibank Fin'l Corp	260,862	6,065,041	1.13
Keycorp	219,440	4,855,110	.91
1st Service Bk Svg	530,000	4,505,000	.84

Fixed IncomeAggregate

<u>Security</u>	<u>Par Value Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
U.S. Treas. 7.25% 5/15/16	69,135,000	\$66,002,320	.82
U.S. Treas. 6.625% 4/30/88	17,100,000	17,158,781	.21
First PV Funding 10.15% 1/15/16	14,500,000	14,985,605	.19
Pacific Bell 8.75% 8/15/25	14,500,000	14,028,750	.17
U.S. Treas. 7.375% 5/15/96	13,640,000	13,720,987	.17

Exempt Systems

<u>Security</u>	<u>Par Value Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
U.S. Treas. 7.25% 5/15/16	69,135,000	\$66,022,320	.87
U.S. Treas. 6.625% 4/30/88	17,100,000	17,158,781	.23
First PV Funding 10.15% 1/15/16	14,500,000	14,985,605	.20
Pacific Bell 8.75% 8/15/25	14,500,000	14,028,750	.19
U.S. Treas. 7.375% 5/15/96	16,640,000	13,720,987	.18

Legal List Systems

<u>Security</u>	<u>Par Value Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
U.S. Treas. 10.5% 2/15/95	2,000,000	\$ 2,390,625	.45
U.S. Treas. 11.75% 11/15/88	2,000,000	2,182,500	.41
U.S. Treas. 7% 6/30/88	2,000,000	2,019,375	.38
U.S. Treas. 10.125% 5/15/93	1,750,000	2,013,593	.38
U.S. Treas. 11.75% 11/15/93	1,500,000	1,861,875	.35

This list excludes holdings of group annuity contracts and retirement plan funding agreements.

The 12/31/86 market value of the aggregate systems was \$8,082,683,108; the market value of exempted systems was \$7,547,439,148; the market value of legal list systems was \$535,243,960.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE Annualized;
TABLE # 3A By Asset Class PAGE ONE

System	1985-1986 Annualized		Equity Return	Fixed Income Return	Cash Return
	Rank	Time Weighted Return			
Adams	57	17.41	24.22	18.75	06.49
Amesbury	93	14.33	33.21	16.35	06.54
Andover	11	20.83	23.12	22.07	07.52
Arlington	43	18.38	24.53	18.77	07.97
Athol	88	14.75	36.56	15.21	08.98
Attleboro	73	16.34	28.65	16.37	06.97
Barnstable Co.	63	16.84	23.53	18.73	09.91
Belmont	71	16.52	19.74	18.42	09.02
Berkshire Co.	55	17.50	36.37	20.02	08.78
Beverly	64	16.78	31.93	20.90	08.42
Blue Hills	102	12.50	17.89	09.96	06.79
Boston	13	20.79	28.19	20.71	08.17
Braintree	31	19.60	26.15	21.38	07.81
Bristol Co.	75	16.14	26.02	15.88	09.37
Brockton	59	17.31	22.02	19.65	06.77
Brookline	96	13.99	48.94	16.70	08.05
Cambridge	2	24.10	36.60	20.82	07.52
Chelsea	39	18.64	27.00	20.31	04.18
Chicopee	83	15.28	34.42	16.67	09.75
Clinton	19	20.39	35.57	19.49	07.21
Concord	98	13.68	-00.74	18.07	07.07
Danvers	92	14.39	26.82	15.08	08.10
Dedham	23	20.06	00.00	20.14	06.13
Dukes County	70	16.53	34.44	16.47	07.57
Easthampton	56	17.45	27.63	21.77	09.13
Essex County	9	21.10	34.88	23.18	08.65
Everett	47	17.91	26.68	17.70	07.97
Fairhaven	81	15.45	29.33	12.00	06.35
Fall River	22	20.14	21.60	21.81	10.03
Falmouth	82	15.35	-01.79	17.79	07.16
Fitchburg	97	13.87	26.15	21.81	08.55
Framingham	72	16.43	34.57	15.95	08.71
Franklin Co.	101	12.91	10.43	15.78	06.27
Gardner	74	16.15	18.10	21.83	07.95
Gloucester	10	21.05	34.68	22.26	08.86
Gr.Lawrence	106	07.48	00.32	02.56	07.29
Greenfield	85	15.20	09.23	15.52	06.97
Hampden County	60	17.28	50.07	15.91	08.18
Hampshire Co.	91	14.42	23.90	16.78	08.23
Haverhill	30	19.71	29.39	23.31	06.73
Hingham	38	18.76	39.05	19.31	07.18
Holyoke	12	20.82	51.81	19.70	07.78
Hull	94	14.28	25.29	20.46	06.67
Lawrence	48	17.82	11.75	21.02	06.63
Leominster	78	15.87	33.00	21.12	07.86
Lexington	16	20.47	45.08	19.73	07.85
Lowell	58	17.32	54.84	18.84	07.33
Lynn	49	17.80	23.15	19.09	07.71
Malden	80	15.65	21.11	17.04	08.01
Marblehead	89	14.67	23.72	16.01	10.01
Marlborough	79	15.74	35.34	14.42	07.09
MHFA	105	09.48	04.95	12.96	09.27
Mass Turnpike	29	19.76	08.30	24.97	07.56

SYSTEM PERFORMANCE Annualized;
 TABLE # 3A By Asset Class PAGE TWO

System	1985-1986 Annualized		Equity Return	Fixed Income Return	Cash Return
	Time Weighted Rank	Return			
MWRA	107	03.45	00.00	00.00	03.45
MassPort	18	20.41	23.35	21.11	08.63
Maynard	40	18.52	32.79	15.81	07.64
Medford	50	17.71	31.02	17.89	08.57
Melrose	37	18.80	29.69	20.52	08.08
Methuen	65	16.72	33.32	16.75	06.79
Middlesex Co.	36	18.84	25.71	19.85	10.92
Milford	95	14.19	25.26	15.32	08.26
Milton	67	16.60	50.39	18.77	06.91
Minuteman	53	17.52	15.76	00.00	07.87
Montague	104	11.20	29.68	16.50	08.06
Natick	25	20.05	36.90	18.24	07.23
Needham	21	20.17	26.85	00.00	08.01
New Bedford	54	17.51	28.74	21.95	07.85
Newburyport	90	14.50	33.77	16.86	07.95
Newton	44	18.33	24.66	20.40	07.50
Norfolk County	15	20.58	34.09	13.66	08.26
North Adams	66	16.61	26.80	19.96	10.14
North Attleboro	86	15.12	24.88	15.78	08.00
Northampton	61	17.16	24.42	17.01	12.21
Northbridge	87	14.75	19.17	20.16	08.95
Norwood	84	15.22	23.58	16.88	07.79
PRIM Board	7	21.37	25.25	21.16	10.32
Peabody	32	19.44	37.60	21.11	07.19
Pittsfield	42	18.43	34.76	19.79	08.93
Plymouth	4	21.91	33.18	21.81	01.27
Plymouth County	14	20.62	33.94	21.15	09.27
Quincy	77	15.93	33.73	16.70	07.90
Reading	41	18.52	25.07	20.65	10.28
Revere	103	12.02	23.71	22.77	07.91
Salem	62	17.00	23.77	22.04	07.50
Saugus	100	13.00	01.28	36.39	06.92
Shrewsbury	45	18.30	24.26	00.00	06.93
Somerville	8	21.24	33.41	19.24	08.17
Southbridge	28	19.91	46.71	19.63	06.48
Springfield	51	17.65	39.85	17.86	06.81
State Employees'	24	20.05	20.11	20.36	06.95
Stoneham	26	19.98	34.61	20.82	08.11
Swampscott	34	19.10	29.10	17.63	10.73
Taunton	5	21.73	35.40	21.10	07.49
Teachers'	27	19.95	19.97	20.36	07.21
Wakefield	17	20.43	25.61	00.00	08.92
Waltham	33	19.39	26.71	19.44	10.68
Watertown	76	15.99	27.59	14.17	06.70
Webster	69	16.54	35.80	12.73	07.97
Wellesley	20	20.30	18.99	23.60	08.88
W. Springfield	99	13.47	-00.31	14.87	10.05
Westfield	46	17.91	33.14	19.36	07.96
Weymouth	3	24.04	27.22	00.00	06.72
Winchester	35	18.96	43.22	21.52	07.53
Winthrop	68	16.58	15.86	18.82	06.01
Woburn	1	26.95	40.48	26.12	08.21
Worcester City	52	17.52	33.56	17.52	08.02
Worcester Co.	6	21.43	39.95	18.85	08.51

TABLE #3A SYSTEM ANNUALIZED PERFORMANCE BY ASSET CLASS

Table #3A Indicates:

The 1985-1986 annualized time-weighted return and ranking of each system listed in alphabetical order;

The annualized return on the equity portion of the retirement system's portfolio which includes common and preferred stock;

The annualized return on the fixed income portion of the retirement system's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements; and

The annualized return on cash which includes cash and cash equivalent investments.

The Minuteman, Needham, Shrewsbury, Wakefield, and Weymouth Retirement Systems hold shares of the PRIT Fund which are considered equity investments. The annualized equity performance as indicated in Table #3A for these systems includes the fixed income performance of these portfolios as well. The Norfolk County Retirement System owns shares of the PRIT Fund. However, some fixed income investments were not transferred to PRIT until March 1986. The fixed income performance for this system reflects the performance of these investments. After the transfer to PRIT was completed, the equity performance for this system includes the performance of the fixed income portfolio.

The State Employees' and Teachers' Retirement Systems hold shares of the Treasurer's Fixed Income Securities Trust, the Treasurer's Management Trust (an equity trust) and, in 1986, the PRIT Fund. The equity performance as indicated in the table reflects the performance of the Treasurer's Management Trust and for 1986 includes the performance of the PRIT Fund. The fixed income performance reflects the performance of the Treasurer's Fixed Income Securities Trust.

Comparative Asset Class Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans, and to standard investment indices, the following table lists the 1985-1986 annualized rate of return by asset class for the comparative standards described in the text accompanying Table #1:

<u>Standard of Comparison</u>	<u>Time-Weighted Rate of Return</u>	<u>Equity Return</u>	<u>Fixed Income Return</u>	<u>Cash Return</u>
SEI Balanced Funds	20.30	25.30	17.90	-
SEI State Government Funds	19.10	24.50	19.20	-
SEI Local Government Funds	19.20	24.40	18.50	-
S&P 500	-	25.18	-	-
Shearson/Lehman Bond Index	-	-	18.43	-
U.S. Treasury Bill Index	-	-	-	07.52
Massachusetts Aggregate	18.95	30.39	19.52	07.73

The Keefe, Bruyette and Woods Bank Index (which includes the stocks of money center institutions and large regional banks) showed a 1985-1986 annualized return of 23.02%.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

TABLE # 4

SYSTEM PERFORMANCE Time Weighted;
Dollar Weighted; Transaction Activity

PAGE ONE

System	1986		1986		1986 Sales Activity			
	Time Weighted Rank	Return	Dollar Weighted Rank	Return	Total Equity Sales (\$)	As a % of Equity Market Value	Total Fixed Income Sales (\$)	As a % of Fixed Income Market Value
Adams	102	09.14	103	08.97	0	0.00	303,327	17.95
Amesbury	89	10.20	88	10.37	823,544	56.51	842,732	27.63
Andover	36	15.15	36	15.23	0	0.00	1,660,321	19.74
Arlington	18	16.65	17	16.65	2,531,324	37.10	3,200,035	15.81
Athol	94	09.82	93	09.70	48,509	11.38	102,000	11.52
Attleboro	63	12.91	62	12.89	1,265,498	65.20	15,469,926	224.31
Barnstable Co.	64	12.68	69	12.51	5,762,167	68.75	6,970,858	20.80
Belmont	97	09.59	94	09.58	4,441,500	60.39	6,876,338	116.60
Berkshire Co.	57	13.24	57	13.28	72,012	06.09	683,223	09.52
Beverly	61	12.98	50	13.45	881,474	20.75	99,377	01.29
Blue Hills	54	13.35	55	13.37	13,399	04.30	214,083	18.15
Boston	24	16.12	25	15.87	156,251,516	90.61	1,254,998,334	319.43
Braintree	21	16.40	16	16.69	780,022	17.82	8,649,877	82.03
Bristol Co.	79	11.43	80	11.34	14,709,268	71.15	11,039,865	62.67
Brockton	67	12.46	63	12.83	8,011,549	81.45	11,777,375	47.06
Brookline	76	11.79	75	11.97	916,896	22.12	18,550,053	73.48
Cambridge	16	16.70	20	16.51	11,153,080	41.09	10,661,305	19.52
Chelsea	52	13.47	51	13.44	2,113,376	47.09	4,624,693	95.47
Chicopee	87	10.53	84	10.79	2,159,834	39.09	14,687,639	106.27
Clinton	68	12.46	74	12.18	200,398	17.02	396,726	21.63
Concord	86	10.67	86	10.74	1,667	00.07	883,834	18.18
Danvers	92	09.83	91	09.92	2,641,243	60.38	2,153,069	22.61
Dedham	65	12.66	66	12.71	0	0.00	146,374	01.81
Dukes County	85	10.68	87	10.61	316,125	33.04	217,629	14.11
Easthampton	46	14.06	48	13.76	116,500	13.25	246,053	12.48
Essex County	12	17.15	11	17.20	8,987,334	103.18	50,723,049	235.22
Everett	50	13.56	53	13.37	2,368,290	65.65	32,326,060	254.87
Fairhaven	95	09.67	95	09.57	N/A	N/A	N/A	N/A
Fall River	33	15.35	35	15.24	3,052,865	42.63	77,814,197	285.79
Falmouth	71	12.41	70	12.47	0	0.00	1,220,137	19.95
Fitchburg	70	12.41	65	12.75	486,691	18.10	4,186,598	56.61
Framingham	49	13.57	56	13.37	0	0.00	6,595,496	33.57
Franklin Co.	105	07.73	105	07.55	1,970,189	64.43	3,622,383	98.18
Gardner	62	12.94	59	13.19	N/A	N/A	N/A	N/A
Gloucester	19	16.57	22	16.44	4,047,876	97.70	19,662,592	289.55
Gr. Lawrence	106	07.28	106	07.01	0	0.00	0	0.00
Greenfield	58	13.19	60	13.17	31,150	07.72	1,358,152	38.27
Hampden County	47	13.87	46	13.88	4,108,049	103.41	16,244,975	75.66
Hampshire Co.	77	11.73	76	11.76	150,192	N/A	1,078,985	08.66
Haverhill	14	16.79	19	16.58	3,299,782	147.53	12,054,943	77.62
Hingham	34	15.32	34	15.36	34,875	03.89	316,181	04.91
Holyoke	45	14.15	45	14.04	9,532,255	71.07	3,101,043	20.31
Hull	80	11.36	78	11.75	711,103	82.74	414,410	20.36
Lawrence	72	12.24	72	12.32	6,325,284	87.45	16,407,498	99.21
Leominster	73	12.22	71	12.45	84,147	04.01	1,459,820	35.57
Lexington	31	15.67	31	15.64	121,407	05.39	1,167,886	10.11
Lowell	43	14.50	41	14.56	261,250	06.40	3,210,995	17.02
Lynn	75	12.20	77	11.75	17,858,619	80.19	17,020,947	86.81
Malden	99	09.38	97	09.42	6,026,365	65.42	6,490,798	66.83
Marblehead	104	07.87	104	07.72	3,055,264	53.10	4,736,435	104.35
Marlborough	91	09.90	92	09.77	463,499	18.12	629,730	12.73
MHFA	98	09.39	98	09.39	0	0.00	35,000	13.12
Mass Turnpike	13	16.90	18	16.60	448,502	10.88	5,476,859	19.55

SYSTEM PERFORMANCE Time Weighted;
Dollar Weighted; Transaction Activity

PAGE TWO

TABLE # 4

System	1986 Time Weighted		1986 Dollar Weighted		1986 Sales Activity			
	Rank	Return	Rank	Return	Total Equity Sales (\$)	As a % of Equity Market Value	Total Fixed Income Sales (\$)	As a % of Fixed Income Market Value
MHRA	107	05.78	107	05.46	0	0.00	0	0.00
MassPort	9	18.68	9	18.68	8,687,125	53.41	7,825,096	23.92
Maynard	90	09.92	90	10.06	370,555	37.78	476,723	38.21
Medford	37	15.13	37	15.05	1,644,777	33.05	2,117,071	15.04
Melrose	20	16.49	15	16.72	1,028,771	53.16	1,048,585	13.17
Methuen	51	13.50	54	13.37	0	0.00	570,000	07.42
Middlesex Co.	39	14.90	38	14.99	21,439,850	73.53	33,815,587	43.75
Milford	103	08.97	102	09.07	1,212,947	63.87	331,142	09.68
Milton	82	10.94	82	10.97	N/A	N/A	N/A	N/A
Minuteman	1	22.05	2	21.23	0	0.00	0	0.00
Montague	101	09.16	99	09.26	N/A	N/A	N/A	N/A
Natick	42	14.56	40	14.64	71,343	02.50	917,270	10.24
Needham	4	20.75	4	20.69	0	0.00	0	0.00
New Bedford	48	13.68	49	13.47	11,466,013	130.41	6,912,945	30.80
Newburyport	100	09.18	101	09.15	1,000,033	66.76	923,588	34.84
Newton	44	14.33	43	14.40	2,559,393	22.93	31,209,312	67.39
Norfolk County	11	17.47	12	17.14	0	0.00	2,549,334	N/A
North Adams	93	09.83	100	09.24	1,369,265	46.18	1,878,013	92.90
North Attleboro	66	12.65	64	12.78	1,992,962	61.46	1,882,012	123.81
Northampton	69	12.45	67	12.55	2,233,814	52.16	1,416,881	40.48
Northbridge	88	10.34	89	10.30	30,093	07.54	83,376	05.61
Norwood	56	13.30	58	13.21	200,000	03.81	667,000	05.52
PRIM Board	7	19.94	8	18.92	253,077,325	25.86	455,590,670	67.51
Peabody	29	15.77	33	15.44	4,190,351	57.57	35,609,568	244.75
Pittsfield	60	13.05	52	13.40	2,453,598	41.67	4,029,575	34.26
Plymouth	30	15.73	30	15.67	367,438	36.49	3,853,628	32.46
Plymouth County	15	16.71	14	16.73	8,553,101	97.03	25,160,266	46.28
Quincy	55	13.31	61	13.14	7,322,843	51.07	19,169,273	50.21
Reading	84	10.73	83	10.94	1,700,884	41.51	3,122,666	54.55
Revere	96	09.65	96	09.48	1,997,334	99.39	1,493,924	38.11
Salem	41	14.58	44	14.38	42,434	05.22	5,670,271	42.16
Saugus	78	11.50	79	11.61	N/A	N/A	N/A	N/A
Shrewsbury	8	19.34	6	19.64	0	0.00	0	0.00
Somerville	59	13.13	68	12.55	5,675,020	29.28	3,321,953	21.41
Southbridge	25	16.06	24	15.88	0	0.00	653,824	38.95
Springfield	38	14.91	39	14.96	7,275,892	57.26	7,046,147	18.31
State Employees	23	16.16	28	15.79	42,500,000	01.72	0	0.00
Stoneham	22	16.38	21	16.50	681,606	30.16	3,019,238	50.97
Swampscott	83	10.86	85	10.77	1,330,928	64.86	698,503	25.90
Taunton	5	20.06	5	19.82	2,102,332	29.05	2,402,480	23.49
Teachers	27	16.03	29	15.72	60,000,000	02.26	0	0.00
Wakefield	3	21.12	3	21.08	0	0.00	0	0.00
Waltham	17	16.65	13	16.74	3,144,518	49.95	55,500,123	228.08
Watertown	74	12.22	73	12.24	3,215,563	125.20	8,450,459	84.40
Webster	53	13.46	47	13.83	373,025	41.87	281,878	20.85
Wellesley	10	17.92	10	17.94	4,186,656	38.37	11,467,072	156.34
W. Springfield	81	11.20	81	11.32	151,151	12.71	8,651,334	125.74
Westfield	32	15.60	27	15.83	1,533,812	43.35	727,500	08.88
Weymouth	6	20.02	7	19.47	900,000	05.08	0	0.00
Winchester	35	15.26	32	15.57	0	0.00	934,890	12.52
Winthrop	40	14.68	42	14.52	0	0.00	332,743	09.84
Woburn	2	21.68	1	21.52	1,064,166	75.80	4,024	00.03
Worcester City	28	15.81	26	15.84	228,000	01.59	8,470,999	13.98
Worcester Co.	26	16.04	23	16.15	3,209,902	22.57	6,120,039	12.68

TABLE #4 TIME/DOLLAR WEIGHTED RETURNS; TRANSACTION ACTIVITY

Table #4 indicates:

The 1986 time-weighted rate of return and rank of each system listed in alphabetical order;

The dollar-weighted rate of return and rank of each retirement system;

(A dollar-weighted rate of return, also referred to as an internal rate of return, is a measure of the fund's actual change in value, unadjusted for the timing of cash flows and other factors which affect total fund value. The dollar-weighted rate of return summarizes the growth rate of the assets rather than the performance of the investment manager, and is helpful in assessing the adequacy of the total fund to meet its obligations. The dollar-weighted rate of return is the investment standard to be compared to the interest assumption used in actuarial valuations determining the retirement systems liabilities and full funding schedules.)

The dollar value of all equity sales made by the retirement system during 1986;

The percentage of December 31, 1986 equity market value represented by the total equity sales during the year;

The dollar value of all fixed income sales made by the retirement system during 1986 (the dollar value of fixed income sales includes principal paydowns on pass-through type securities); and

The percentage of December 31, 1986 fixed income market value represented by the total fixed income sales during the year.

The dollar-weighted rate of return for the aggregate of the 106 systems was 15.41%.

These dollar-weighted rates of return compare with an actuarial interest assumption of 7.5% in the most recent Retirement Law Commission study (as of January 1, 1983), and an actuarial interest assumption of 8.0% in the development of the Pension Funding and Reform legislation filed by Governor Dukakis.

The information in Table #4 gives an indication as to whether the retirement system maintained an active or passive investment style.

Systems joining the PRIT Fund in 1986 (Fairhaven, Gardner, Milton, Montague and Saugus) liquidated their entire portfolios and purchased the full value in PRIT units, thus, turnover for these systems has not been included in this table.

The turnover percentage for fixed income investments for the Norfolk County Retirement System has not been included due to the fact no fixed income investments were owned as of December 31, 1986. The equity turnover percentage for the Hampshire County Retirement System has not been included due to the fact no equity investments were owned as of December 31, 1986.

Turnover as reported for systems participating in the PRIT Fund, as well as for State Employees' and Teachers', reflects redemption of trust fund units.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
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SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5A

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986 Quarterly Returns			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Flx Sales	1986	First	Second	Third	Fourth
	Weighted	Wghtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Cash	Return	as % of	as % of				
	Return	Return	Value		Income			Income			Income			Eq Mkt Val	Flx Mkt Val				
Adams	57	102	96	74	58	99	98	78	102	31	72	54	103	93	66	96	62	15	107
Amesbury	93	89	87	36	81	98	69	81	83	51	62	31	88	31	48	79	56	63	86
Andover	11	36	71	83	9	69	74	37	65	102	4	80	36	101	60	57	91	33	15
Arlington	43	18	29	71	56	49	19	41	47	58	19	82	17	49	68	46	42	17	44
Athol	88	94	103	16	91	18	89	70	34	73	90	5	93	67	78	100	52	52	60
Attleboro	73	63	67	49	80	84	50	80	82	72	24	56	62	22	8	69	78	55	39
Barnstable Co.	63	64	17	80	59	11	67	59	27	70	12	96	69	18	56	47	47	57	82
Belmont	71	97	55	89	60	17	79	74	106	5	81	92	94	27	12	48	4	103	93
Berkshire Co.	55	57	57	17	39	24	46	38	21	98	56	8	57	72	83	76	85	14	59
Beverly	64	61	51	41	26	31	40	40	24	45	69	33	50	60	91	56	35	88	38
Blue Hills	102	54	105	93	100	90	38	56	79	77	29	49	55	76	65	82	73	20	52
Boston	13	24	4	50	29	37	45	21	50	52	53	45	25	9	1	10	55	77	57
Braintree	31	21	45	61	18	60	59	23	46	53	48	51	16	63	21	39	92	31	16
Bristol Co.	75	79	19	62	85	13	73	84	7	15	83	72	80	16	28	31	14	96	94
Brockton	59	67	16	84	45	92	85	36	84	64	57	25	63	12	33	25	94	79	78
Brookline	96	76	28	5	76	43	2	62	31	84	6	103	75	59	24	92	51	19	77
Cambridge	2	16	7	15	27	68	26	55	78	36	39	81	20	45	62	17	61	38	67
Chelsea	39	52	58	54	36	105	32	58	105	29	86	27	51	38	17	28	106	37	74
Chicopee	83	87	32	28	77	12	81	82	13	56	46	52	84	46	13	101	98	69	6
Clinton	19	68	92	19	47	77	68	53	86	38	75	30	74	64	53	27	37	80	96
Concord	98	86	78	104	62	82	104	67	41	39	49	65	86	84	64	94	89	48	48
Danvers	92	92	50	56	92	40	87	90	68	42	40	70	91	28	52	72	72	59	98
Dedham	23	65	75	107	38	103	107	86	4	106	1	89	66	89	90	107	99	34	1
Dukes County	70	85	98	27	79	65	48	95	95	43	78	20	87	52	70	75	21	90	73
Easthampton	56	46	93	51	16	16	84	9	80	59	60	22	48	65	77	32	66	54	72
Essex County	9	12	23	22	6	26	34	10	22	50	38	63	11	5	6	15	43	93	5
Everett	47	50	46	59	66	48	63	72	35	61	9	107	53	20	4	42	71	64	47
Fairhaven	81	95	95	46	99	101	43	100	99	17	97	46	95	102	102	98	58	81	32
Fall River	22	33	21	85	14	9	47	34	23	75	23	55	35	41	3	43	69	42	28
Falmouth	82	71	82	105	65	80	105	69	97	101	2	104	70	86	59	88	93	7	68
Fitchburg	97	70	49	60	15	29	71	52	19	76	73	9	65	62	29	85	63	27	61
Framingham	72	49	31	26	83	25	57	75	20	93	7	79	56	98	45	81	45	22	62
Franklin Co.	101	105	79	97	87	102	96	92	85	25	74	59	105	24	16	78	13	97	105
Gardner	74	62	85	92	12	52	72	7	74	21	101	26	59	102	102	70	74	30	64
Gloucester	10	19	63	24	8	23	33	28	14	30	44	102	22	7	2	8	40	99	4
Gr. Lawrence	106	106	101	102	101	74	102	99	70	90	105	3	106	92	100	105	81	8	100
Greenfield	85	58	89	98	89	83	42	83	76	99	32	18	60	69	39	89	90	3	65

SYSTEM RANKING BY SELECTED CRITERIA

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TABLE # 5A

SYSTEM RANKING BY SELECTED CRITERIA

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986 Quarterly Returns			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset Allocation	Fixed	Cash	Dollar	Eq Sales	Fix Sales	1986	Quarterly		
	Weighted	Wgtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Cash	Return	as % of	as % of		First	Second	Third
			Value		Income			Income			Income			Eq Mkt Val	Fix Mkt Val				
PRIM Board	7	7	3	67	19	5	29	24	1	2	89	78	8	56	25	14	8	82	7
Peabody	32	29	37	13	23	78	35	25	51	33	22	106	33	29	5	21	96	76	11
Pittsfield	42	60	34	23	42	20	37	31	40	48	64	29	52	43	44	66	38	51	70
Plymouth	4	30	56	37	13	107	95	30	107	100	5	87	30	50	46	58	84	21	21
Plymouth County	14	15	12	30	20	15	23	27	12	88	10	75	14	8	34	37	88	35	9
Quincy	77	55	13	32	75	55	36	73	28	47	17	98	61	36	32	68	33	47	76
Reading	41	84	66	68	30	6	90	47	15	24	55	91	83	44	30	30	17	100	90
Revere	103	96	47	78	7	54	93	6	48	89	103	4	96	6	41	59	86	73	97
Salem	62	41	39	76	10	71	16	14	88	103	28	14	44	74	36	63	82	18	51
Saugus	100	78	81	101	1	87	101	1	54	23	102	10	79	102	102	93	79	39	43
Shrewsbury	45	8	74	73	104	86	22	103	45	20	100	28	6	87	97	7	27	70	31
Somerville	8	59	22	34	51	38	56	61	36	3	79	99	68	54	54	12	19	98	87
Southbridge	28	25	97	6	46	100	4	43	64	67	71	12	24	85	38	52	68	9	50
Springfield	51	38	11	11	64	89	8	54	73	74	58	16	39	30	63	73	31	43	29
State Employees'	24	23	2	87	34	85	62	45	98	27	52	90	28	82	96	24	46	61	36
Stoneham	26	22	68	25	28	39	27	33	49	62	50	43	21	53	31	38	25	40	56
Swampscott	34	83	90	47	67	3	91	63	26	26	66	69	85	23	49	20	30	95	106
Taunton	5	5	41	20	24	72	6	11	104	28	61	68	5	55	51	9	3	89	30
Teachers'	27	27	1	88	35	76	65	44	93	32	37	100	29	81	93	23	59	56	40
Wakefield	17	3	59	64	107	21	25	105	11	8	93	64	3	95	99	4	18	78	20
Waltham	33	17	26	58	48	4	61	17	6	69	16	86	13	37	7	64	97	2	37
Watertown	76	74	53	52	95	95	5	98	90	79	30	48	73	3	20	67	107	41	33
Webster	69	53	100	18	98	50	41	91	3	35	76	35	47	42	55	41	22	91	53
Wellesley	20	10	42	91	4	22	64	2	101	1	88	93	10	47	9	18	29	58	41
W. Springfield	99	81	73	103	93	8	103	85	2	85	8	83	81	66	10	95	103	28	35
Westfield	46	32	48	38	49	51	7	35	63	60	59	21	27	40	84	49	6	92	10
Weymouth	3	6	44	53	102	94	15	102	91	11	95	61	7	75	101	5	20	85	22
Winchester	35	35	64	8	17	67	14	18	81	87	25	41	32	96	76	62	70	36	14
Winthrop	68	40	88	94	55	104	28	49	89	71	47	38	42	97	81	54	75	24	55
Woburn	1	2	52	9	2	35	53	3	8	97	3	101	1	14	92	3	105	60	2
Worcester City	52	28	6	33	68	44	31	13	56	81	33	44	26	83	71	71	48	45	3
Worcester Co.	6	26	10	10	53	30	13	65	43	68	26	57	23	58	75	55	87	1	71

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986 Quarterly Returns			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Fix Sales	1986	Quarterly			Returns
	Weighted	Wgtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Weighted	as % of	as % of		First	Second	Third	Fourth
	Return	Return	Value									Return	Eq Mkt Val	Fix Mkt Val					
Woburn	1	2	52	9	2	35	53	3	8	97	3	101	1	14	92	3	105	60	2
Cambridge	2	16	7	15	27	68	26	55	78	36	39	81	20	45	62	17	61	38	67
Weymouth	3	6	44	53	102	94	15	102	91	11	95	61	7	75	101	5	20	85	22
Plymouth	4	30	56	37	13	107	95	30	107	100	5	87	30	50	46	58	84	21	21
Taunton	5	5	41	20	24	72	6	11	104	28	61	68	5	55	51	9	3	89	30
Worcester Co.	6	26	10	10	53	30	13	65	43	68	26	57	23	58	75	55	87	1	71
PRIM Board	7	7	3	67	19	5	29	24	1	2	89	78	8	56	25	14	8	82	7
Somerville	8	59	22	34	51	38	56	61	36	3	79	99	68	54	54	12	19	98	87
Essex County	9	12	23	22	6	26	34	10	22	50	38	63	11	5	6	15	43	93	5
Gloucester	10	19	63	24	8	23	33	28	14	30	44	102	22	7	2	8	40	99	4
Andover	11	36	71	83	9	69	74	37	65	102	4	80	36	101	60	57	91	33	15
Holyoke	12	45	27	2	44	62	17	46	30	22	68	88	45	17	58	53	26	87	18
Boston	13	24	4	50	29	37	45	21	50	52	53	45	25	9	1	10	55	77	57
Plymouth County	14	15	12	30	20	15	23	27	12	88	10	75	14	8	34	37	88	35	9
Norfolk County	15	11	9	29	96	32	44	101	10	10	94	62	12	100	102	22	15	83	19
Lexington	16	31	54	7	43	58	20	39	53	82	13	74	31	73	80	33	32	66	34
Wakefield	17	3	59	64	107	21	25	105	11	8	93	64	3	95	99	4	18	78	20
MassPort	18	9	14	81	22	27	49	5	62	34	35	95	9	32	50	13	12	53	63
Clinton	19	68	92	19	47	77	68	53	86	38	75	30	74	64	53	27	37	80	96
Wellesley	20	10	42	91	4	22	64	2	101	1	88	93	10	47	9	18	29	58	41
Needham	21	4	36	55	103	46	24	107	58	12	96	53	4	88	95	2	24	84	23
Fall River	22	33	21	85	14	9	47	34	23	75	23	55	35	41	3	43	69	42	28
Dedham	23	65	75	107	38	103	107	86	4	106	1	89	66	89	90	107	99	34	1
State Employees'	24	23	2	87	34	85	62	45	98	27	52	90	28	82	96	24	46	61	36
Natick	25	42	60	14	61	75	39	60	59	55	15	105	40	80	79	36	23	46	95
Stoneham	26	22	68	25	28	39	27	33	49	62	50	43	21	53	31	38	25	40	56
Teachers'	27	27	1	88	35	76	65	44	93	32	37	100	29	81	93	23	59	56	40
Southbridge	28	25	97	6	46	100	4	43	64	67	71	12	24	85	38	52	68	9	50
Mass Turnpike	29	13	20	99	3	66	100	4	67	95	20	37	18	68	61	35	101	10	45
Haverhill	30	14	33	45	5	93	9	8	42	96	21	34	19	1	22	34	80	16	46
Braintree	31	21	45	61	18	60	59	23	46	53	48	51	16	63	21	39	92	31	16
Peabody	32	29	37	13	23	78	35	25	51	33	22	106	33	29	5	21	96	76	11
Waltham	33	17	26	58	48	4	61	17	6	69	16	86	13	37	7	64	97	2	37
Swampscott	34	83	90	47	67	3	91	63	26	26	66	69	85	23	49	20	30	95	106
Winchester	35	35	64	8	17	67	14	18	81	87	25	41	32	96	76	62	70	36	14

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TABLE # 5B

System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986			Transaction Activity		1986			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Fix Sales	Eq Mkt Val	Fix Mkt Val	1986 First	Quarterly Second	Returns Third	Fourth	
	Weighted Return	Wghtd Return	Market Value	Equity	Fixed Income	Cash	Equity	Fixed Income	Cash	Equity	Fixed Income	Cash	Return	as % of							as % of
Middlesex Co.	36	39	5	63	41	2	58	32	29	54	34	66	38	15	35	61	49	50	24		
Melrose	37	20	62	43	31	41	10	29	25	78	18	58	15	33	72	45	39	25	42		
Hingham	38	34	76	12	50	79	12	42	94	94	14	60	34	78	89	84	100	6	12		
Chelsea	39	52	58	54	36	105	32	58	105	29	86	27	51	38	17	28	106	37	74		
Maynard	40	90	99	40	86	64	70	94	100	37	87	11	90	48	40	65	41	75	103		
Reading	41	84	66	68	30	6	90	47	15	24	55	91	83	44	30	30	17	100	90		
Pittsfield	42	60	34	23	42	20	37	31	40	48	64	29	52	43	44	66	38	51	70		
Arlington	43	18	29	71	56	49	19	41	47	58	19	82	17	49	68	46	42	17	44		
Newton	44	44	8	70	33	70	83	19	39	83	42	24	43	57	26	50	76	29	58		
Shrewsbury	45	8	74	73	104	86	22	103	45	20	100	28	6	87	97	7	27	70	31		
Westfield	46	32	48	38	49	51	7	35	63	60	59	21	27	40	84	49	6	92	10		
Everett	47	50	46	59	66	48	63	72	35	61	9	107	53	20	4	42	71	64	47		
Lawrence	48	72	30	96	25	97	99	22	103	40	27	94	72	10	15	51	2	106	17		
Lynn	49	75	15	82	52	63	77	51	44	16	80	77	77	13	19	16	10	101	85		
Medford	50	37	35	42	63	28	21	57	17	63	41	50	37	51	69	44	34	32	69		
Springfield	51	38	11	11	64	89	8	54	73	74	58	16	39	30	63	73	31	43	29		
Worcester City	52	28	6	33	68	44	31	13	56	81	33	44	26	83	71	71	48	45	3		
Minuteman	53	1	106	95	105	56	18	104	61	4	91	71	2	94	94	1	16	86	8		
New Bedford	54	48	18	48	11	59	76	15	69	66	63	17	49	2	47	29	50	62	81		
Berkshire Co.	55	57	57	17	39	24	46	38	21	98	56	8	57	72	83	76	85	14	59		
Easthampton	56	46	93	51	16	16	84	9	80	59	60	22	48	65	77	32	66	54	72		
Adams	57	102	96	74	58	99	98	78	102	31	72	54	103	93	66	96	62	15	107		
Lowell	58	43	24	1	54	73	3	50	66	91	51	13	41	71	67	77	57	11	54		
Brockton	59	67	16	84	45	92	85	36	84	64	57	25	63	12	33	25	94	79	78		
Hampden County	60	47	25	4	84	36	11	77	33	92	31	32	46	4	23	90	65	26	13		
Northampton	61	69	77	72	70	1	75	48	5	9	82	85	67	35	37	6	7	104	102		
Salem	62	41	39	76	10	71	16	14	88	103	28	14	44	74	36	63	82	18	51		
Barnstable Co.	63	64	17	80	59	11	67	59	27	70	12	96	69	18	56	47	47	57	82		
Beverly	64	61	51	41	26	31	40	40	24	45	69	33	50	60	91	56	35	88	38		
Methuen	65	51	70	35	74	91	54	68	92	86	11	73	54	91	86	60	102	12	80		
North Adams	66	93	86	57	40	7	86	26	9	14	98	47	100	39	18	11	36	102	104		
Milton	67	82	61	3	57	88	1	88	32	6	92	67	82	102	102	74	104	74	25		
Winthrop	68	40	88	94	55	104	28	49	89	71	47	38	42	97	81	54	75	24	55		
Webster	69	53	100	18	98	50	41	91	3	35	76	35	47	42	55	41	22	91	53		
Dukes County	70	85	98	27	79	65	48	95	95	43	78	20	87	52	70	75	21	90	73		

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5B

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Fix Sales	1986	Quarterly			Returns
	Weighted	Wgtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Cash	Return	as % of		as % of	First	Second	Third
	Return	Return	Value		Income			Income			Income			Eq Mkt Val	Fix Mkt Val				
Belmont	71	97	55	89	60	17	79	74	106	5	81	92	94	27	12	48	4	103	93
Framingham	72	49	31	26	83	25	57	75	20	93	7	79	56	98	45	81	45	22	62
Attleboro	73	63	67	49	80	84	50	80	82	72	24	56	62	22	8	69	78	55	39
Gardner	74	62	85	92	12	52	72	7	74	21	101	26	59	102	102	70	74	30	64
Bristol Co.	75	79	19	62	85	13	73	84	7	15	83	72	80	16	28	31	14	96	94
Watertown	76	74	53	52	95	95	5	98	90	79	30	48	73	3	20	67	107	41	33
Quincy	77	55	13	32	75	55	36	73	28	47	17	98	61	36	32	68	33	47	76
Leominster	78	73	69	39	21	57	51	20	72	65	85	7	71	77	42	83	60	23	83
Marlborough	79	91	72	21	94	81	60	96	57	46	65	36	92	61	74	80	44	67	88
Malden	80	99	40	86	69	45	92	76	75	19	70	97	97	21	27	26	1	107	99
Fairhaven	81	95	95	46	99	101	43	100	99	17	97	46	95	102	102	98	58	81	32
Falmouth	82	71	82	105	65	80	105	69	97	101	2	104	70	86	59	88	93	7	68
Chicopee	83	87	32	28	77	12	81	82	13	56	46	52	84	46	13	101	98	69	6
Norwood	84	56	43	79	71	61	66	64	52	44	36	76	58	79	88	97	5	44	49
Greenfield	85	58	89	98	89	83	42	83	76	99	32	18	60	69	39	89	90	3	65
North Attleboro	86	66	83	69	88	47	52	89	87	13	104	19	64	26	11	87	28	65	26
Northbridge	87	88	102	90	37	19	97	79	18	80	45	23	89	70	87	91	77	49	66
Athol	88	94	103	16	91	18	89	70	34	73	90	5	93	67	78	100	52	52	60
Marblehead	89	104	65	77	82	10	94	71	38	7	84	84	104	34	14	40	9	105	92
Newburyport	90	100	91	31	72	53	80	87	77	41	67	40	101	19	43	86	54	68	84
Hampshire Co.	91	77	38	75	73	34	78	66	55	105	43	6	76	102	85	99	83	4	75
Danvers	92	92	50	56	92	40	87	90	68	42	40	70	91	28	52	72	72	59	98
Amesbury	93	89	87	36	81	98	69	81	83	51	62	31	88	31	48	79	56	63	86
Hull	94	80	94	65	32	96	88	16	71	57	54	39	78	11	57	19	67	94	89
Milford	95	103	80	66	90	33	55	97	60	49	77	15	102	25	82	102	11	71	91
Brookline	96	76	28	5	76	43	2	62	31	84	6	103	75	59	24	92	51	19	77
Fitchburg	97	70	49	60	15	29	71	52	19	76	73	9	65	62	29	85	63	27	61
Concord	98	86	78	104	62	82	104	67	41	39	49	65	86	84	64	94	89	48	48
W. Springfield	99	81	73	103	93	8	103	85	2	85	8	83	81	66	10	95	103	28	35
Saugus	100	78	81	101	1	87	101	1	54	23	102	10	79	102	102	93	79	39	43
Franklin Co.	101	105	79	97	87	102	96	92	85	25	74	59	105	24	16	78	13	97	105
Blue Hills	102	54	105	93	100	90	38	56	79	77	29	49	55	76	65	82	73	20	52
Revere	103	96	47	78	7	54	93	6	48	89	103	4	96	6	41	59	86	73	97
Montague	104	101	104	44	78	42	30	12	37	18	99	42	99	102	102	103	64	72	27
MHFA	105	98	84	100	97	14	82	93	16	104	106	2	98	90	73	104	53	5	79
Gr. Lawrence	106	106	101	102	101	74	102	99	70	90	105	3	106	92	100	105	81	8	100
MWRA	107	107	107	106	106	106	106	106	96	107	107	1	107	99	98	106	95	13	101

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5C

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986 Quarterly Returns				
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Fix Sales	Eq Mkt Val	Fix Mkt Val	First	Second	Third	Fourth
	Weighted	Wgtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Weighted	as % of	as % of						
Minuteman	53	1	106	95	105	56	18	104	61	4	91	71	2	94	94	1	16	86	8	
Woburn	1	2	52	9	2	35	53	3	8	97	3	101	1	14	92	3	105	60	2	
Wakefield	17	3	59	64	107	21	25	105	11	8	93	64	3	95	99	4	18	78	20	
Needham	21	4	36	55	103	46	24	107	58	12	96	53	4	88	95	2	24	84	23	
Taunton	5	5	41	20	24	72	6	11	104	28	61	68	5	55	51	9	3	89	30	
Weymouth	3	6	44	53	102	94	15	102	91	11	95	61	7	75	101	5	20	85	22	
PRIM Board	7	7	3	67	19	5	29	24	1	2	89	78	8	56	25	14	8	82	7	
Shrewsbury	45	8	74	73	104	86	22	103	45	20	100	28	6	87	97	7	27	70	31	
MassPort	18	9	14	81	22	27	49	5	62	34	35	95	9	32	50	13	12	53	63	
Wellesley	20	10	42	91	4	22	64	2	101	1	88	93	10	47	9	18	29	58	41	
Norfolk County	15	11	9	29	96	32	44	101	10	10	94	62	12	100	102	22	15	83	19	
Essex County	9	12	23	22	6	26	34	10	22	50	38	63	11	5	6	15	43	93	5	
Mass Turnpike	29	13	20	99	3	66	100	4	67	95	20	37	18	68	61	35	101	10	45	
Haverhill	30	14	33	45	5	93	9	8	42	96	21	34	19	1	22	34	80	16	46	
Plymouth County	14	15	12	30	20	15	23	27	12	88	10	75	14	8	34	37	88	35	9	
Cambridge	2	16	7	15	27	68	26	55	78	36	39	81	20	45	62	17	61	38	67	
Waltham	33	17	26	58	48	4	61	17	6	69	16	86	13	37	7	64	97	2	37	
Arlington	43	18	29	71	56	49	19	41	47	58	19	82	17	49	68	46	42	17	44	
Gloucester	10	19	63	24	8	23	33	28	14	30	44	102	22	7	2	8	40	99	4	
Melrose	37	20	62	43	31	41	10	29	25	78	18	58	15	33	72	45	39	25	42	
Braintree	31	21	45	61	18	60	59	23	46	53	48	51	16	63	21	39	92	31	16	
Stoneham	26	22	68	25	28	39	27	33	49	62	50	43	21	53	31	38	25	40	56	
State Employees'	24	23	2	87	34	85	62	45	98	27	52	90	28	82	96	24	46	61	36	
Boston	13	24	4	50	29	37	45	21	50	52	53	45	25	9	1	10	55	77	57	
Southbridge	28	25	97	6	46	100	4	43	64	67	71	12	24	85	38	52	68	9	50	
Worcester Co.	6	26	10	10	53	30	13	65	43	68	26	57	23	58	75	55	87	1	71	
Teachers'	27	27	1	88	35	76	65	44	93	32	37	100	29	81	93	23	59	56	40	
Worcester City	52	28	6	33	68	44	31	13	56	81	33	44	26	83	71	71	48	45	3	
Peabody	32	29	37	13	23	78	35	25	51	33	22	106	33	29	5	21	96	76	11	
Plymouth	4	30	56	37	13	107	95	30	107	100	5	87	30	50	46	58	84	21	21	
Lexington	16	31	54	7	43	58	20	39	53	82	13	74	31	73	80	33	32	66	34	
Westfield	46	32	48	38	49	51	7	35	63	60	59	21	27	40	84	49	6	92	10	
Fall River	22	33	21	85	14	9	47	34	23	75	23	55	35	41	3	43	69	42	28	
Hingham	38	34	76	12	50	79	12	42	94	94	14	60	34	78	89	84	100	6	12	
Winchester	35	35	64	8	17	67	14	18	81	87	25	41	32	96	76	62	70	36	14	

SYSTEM RANKING BY SELECTED CRITERIA

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986	Transaction Activity		1986 Quarterly Returns			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset Allocation	Dollar	Eq Sales	Fix Sales	Eq Mkt Val	Fix Mkt Val	First	Second	Third	Fourth
	Weighted	Wghtd	Market	Equity	Fixed	Cash	Equity	Fixed	Cash	Equity	Fixed	Cash	Weighted	as % of	as % of				
Andover	11	36	71	83	9	69	74	37	65	102	4	80	36	101	60	57	91	33	15
Medford	50	37	35	42	63	28	21	57	17	63	41	50	37	51	69	44	34	32	69
Springfield	51	38	11	11	64	89	8	54	73	74	58	16	39	30	63	73	31	43	29
Middlesex Co.	36	39	5	63	41	2	58	32	29	54	34	66	38	15	35	61	49	50	24
Winthrop	68	40	88	94	55	104	28	49	89	71	47	38	42	97	81	54	75	24	55
Salem	62	41	39	76	10	71	16	14	88	103	28	14	44	74	36	63	82	18	51
Natick	25	42	60	14	61	75	39	60	59	55	15	105	40	80	79	36	23	46	95
Lowell	58	43	24	1	54	73	3	50	66	91	51	13	41	71	67	77	57	11	54
Newton	44	44	8	70	33	70	83	19	39	83	42	24	43	57	26	50	76	29	58
Holyoke	12	45	27	2	44	62	17	46	30	22	68	88	45	17	58	53	26	87	18
Easthampton	56	46	93	51	16	16	84	9	80	59	60	22	48	65	77	32	66	54	72
Hampden County	60	47	25	4	84	36	11	77	33	92	31	32	46	4	23	90	65	26	13
New Bedford	54	48	18	48	11	59	76	15	69	66	63	17	49	2	47	29	50	62	81
Framingham	72	49	31	26	83	25	57	75	20	93	7	79	56	98	45	81	45	22	62
Everett	47	50	46	59	66	48	63	72	35	61	9	107	53	20	4	42	71	64	47
Methuen	65	51	70	35	74	91	54	68	92	86	11	73	54	91	86	60	102	12	80
Chelsea	39	52	58	54	36	105	32	58	105	29	86	27	51	38	17	28	106	37	74
Webster	69	53	100	18	98	50	41	91	3	35	76	35	47	42	55	41	22	91	53
Blue Hills	102	54	105	93	100	90	38	56	79	77	29	49	55	76	65	82	73	20	52
Quincy	77	55	13	32	75	55	36	73	28	47	17	98	61	36	32	68	33	47	76
Norwood	84	56	43	79	71	61	66	64	52	44	36	76	58	79	88	97	5	44	49
Berkshire Co.	55	57	57	17	39	24	46	38	21	98	56	8	57	72	83	76	85	14	59
Greenfield	85	58	89	98	89	83	42	83	76	99	32	18	60	69	39	89	90	3	65
Somerville	8	59	22	34	51	38	56	61	36	3	79	99	68	54	54	12	19	98	87
Pittsfield	42	60	34	23	42	20	37	31	40	48	64	29	52	43	44	66	38	51	70
Beverly	64	61	51	41	26	31	40	40	24	45	69	33	50	60	91	56	35	88	38
Gardner	74	62	85	92	12	52	72	7	74	21	101	26	59	102	102	70	74	30	64
Attleboro	73	63	67	49	80	84	50	80	82	72	24	56	62	22	8	69	78	55	39
Barnstable Co.	63	64	17	80	59	11	67	59	27	70	12	96	69	18	56	47	47	57	82
Dedham	23	65	75	107	38	103	107	86	4	106	1	89	66	89	90	107	99	34	1
North Attleboro	86	66	83	69	88	47	52	89	87	13	104	19	64	26	11	87	28	65	26
Brockton	59	67	16	84	45	92	85	36	84	64	57	25	63	12	33	25	94	79	78
Clinton	19	68	92	19	47	77	68	53	86	38	75	30	74	64	53	27	37	80	96
Northampton	61	69	77	72	70	1	75	48	5	9	82	85	67	35	37	6	7	104	102
Fitchburg	97	70	49	60	15	29	71	52	19	76	73	9	65	62	29	85	63	27	61

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5C

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System	1985-1986	1986	12/31/86	1985-1986			1986			1986			1986			Transaction Activity		1986 Quarterly Returns			
	Time	Time	Asset	Return	By Asset	Type	Return	By Asset	Type	Asset	Allocation	Dollar	Eq Sales	Fix Sales	1986	Quarterly	Returns				
	Weighted	Wgtd	Market	Equity	Fixed		Equity	Fixed		Equity	Fixed	Weighted	as % of	as % of							
	Return	Return	Value		Income	Cash		Income	Cash		Income	Cash	Return	Eq Mkt Val	Fix Mkt Val	First	Second	Third	Fourth		
Falmouth	82	71	82	105	65	80	105	69	97	101	2	104	70	86	59	88	93	7	68		
Lawrence	48	72	30	96	25	97	99	22	103	40	27	94	72	10	15	51	2	106	17		
Leominster	78	73	69	39	21	57	51	20	72	65	85	7	71	77	42	83	60	23	83		
Watertown	76	74	53	52	95	95	5	98	90	79	30	48	73	3	20	67	107	41	33		
Lynn	49	75	15	82	52	63	77	51	44	16	80	77	77	13	19	16	10	101	85		
Brookline	96	76	28	5	76	43	2	62	31	84	6	103	75	59	24	92	51	19	77		
Hampshire Co.	91	77	38	75	73	34	78	66	55	105	43	6	76	102	85	99	83	4	75		
Saugus	100	78	81	101	1	87	101	1	54	23	102	10	79	102	102	93	79	39	43		
Bristol Co.	75	79	19	62	85	13	73	84	7	15	83	72	80	16	28	31	14	96	94		
Hull	94	80	94	65	32	96	88	16	71	57	54	39	78	11	57	19	67	94	89		
W. Springfield	99	81	73	103	93	8	103	85	2	85	8	83	81	66	10	95	103	28	35		
Milton	67	82	61	3	57	88	1	88	32	6	92	67	82	102	102	74	104	74	25		
Swampscott	34	83	90	47	67	3	91	63	26	26	66	69	85	23	49	20	30	95	106		
Reading	41	84	66	68	30	6	90	47	15	24	55	91	83	44	30	30	17	100	90		
Dukes County	70	85	98	27	79	65	48	95	95	43	78	20	87	52	70	75	21	90	73		
Concord	98	86	78	104	62	82	104	67	41	39	49	65	86	84	64	94	89	48	48		
Chicopee	83	87	32	28	77	12	81	82	13	56	46	52	84	46	13	101	98	69	6		
Northbridge	87	88	102	90	37	19	97	79	18	80	45	23	89	70	87	91	77	49	66		
Amesbury	93	89	87	36	81	98	69	81	83	51	62	31	88	31	48	79	56	63	86		
Maynard	40	90	99	40	86	64	70	94	100	37	87	11	90	48	40	65	41	75	103		
Marlborough	79	91	72	21	94	81	60	96	57	46	65	36	92	61	74	80	44	67	88		
Danvers	92	92	50	56	92	40	87	90	68	42	40	70	91	28	52	72	72	59	98		
North Adams	66	93	86	57	40	7	86	26	9	14	98	47	100	39	18	11	36	102	104		
Athol	88	94	103	16	91	18	89	70	34	73	90	5	93	67	78	100	52	52	60		
Fairhaven	81	95	95	46	99	101	43	100	99	17	97	46	95	102	102	98	58	81	32		
Revere	103	96	47	78	7	54	93	6	48	89	103	4	96	6	41	59	86	73	97		
Belmont	71	97	55	89	60	17	79	74	106	5	81	92	94	27	12	48	4	103	93		
MHFA	105	98	84	100	97	14	82	93	16	104	106	2	98	90	73	104	53	5	79		
Malden	80	99	40	86	69	45	92	76	75	19	70	97	97	21	27	26	1	107	99		
Newburyport	90	100	91	31	72	53	80	87	77	41	67	40	101	19	43	86	54	68	84		
Montague	104	101	104	44	78	42	30	12	37	18	99	42	99	102	102	103	64	72	27		
Adams	57	102	96	74	58	99	98	78	102	31	72	54	103	93	66	96	62	15	107		
Milford	95	103	80	66	90	33	55	97	60	49	77	15	102	25	82	102	11	71	91		
Marblehead	89	104	65	77	82	10	94	71	38	7	84	84	104	34	14	40	9	105	92		
Franklin Co.	101	105	79	97	87	102	96	92	85	25	74	59	105	24	16	78	13	97	105		
Gr. Lawrence	106	106	101	102	101	74	102	99	70	90	105	3	106	92	100	105	81	8	100		
MWRA	107	107	107	106	106	106	106	106	96	107	107	1	107	99	98	106	95	13	101		

TABLE #5 SYSTEM RANKINGS

Table #5 is presented in three formats: Table #5A lists the systems in alphabetical order.

Table #5B lists the systems such that the system with the highest 1985-1986 time-weighted rate of return is listed first and the system with the lowest time-weighted rate of return is listed last.

Table #5C lists the systems such that the system with the highest 1986 time-weighted rate of return is listed first and the system with the lowest time-weighted rate of return is listed last.

Table #5 ranks the systems from 1 through 107 according to nineteen different criteria, as follows:

The 1985-1986 time-weighted rate of return with the highest return ranked 1 and the lowest return ranked 107;

The 1986 time-weighted rate of return with the highest return ranked 1 and the lowest return ranked 107;

The size of each system based on December 31, 1986 market values with the largest system ranked 1 and the smallest system ranked 107;

The 1985-1986 return by asset type for equity, fixed income and cash investments with the highest return in each asset class ranked 1 and the lowest return in each asset class ranked 107;

The 1986 return by asset type for equity, fixed income and cash investments with the highest return in each asset class ranked 1 and the lowest return in each asset class ranked 107;

The 1986 asset allocation for equity, fixed income and cash investments with those systems having the largest commitment to an asset class ranked 1 and the system with the smallest commitment to an asset class ranked 107;

The 1986 dollar-weighted rate of return with the system with the highest return ranked 1 and the system with the lowest return ranked 107;

Transaction activity depicted by the percentage of equity and fixed income retirement system assets (using December 31, 1986 market values) represented by sales of equity and fixed income securities with the system having the highest percentage of sales ranked 1 and the system with the lowest percentages of sales ranked 107; and

The 1986 quarterly rates of return for the first, second, third and fourth quarters with the system having the highest return in a quarter ranked 1 and the system with the lowest return in a quarter ranked 107.

The criteria by which systems are ranked in Table #5 are all numerically described in Tables #1 through #4. By reference to those tables, the actual value for any criteria for any system ranked in Table #5 can be determined.

TABLE # 6

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE
By Size

Size	1985-1986 Annualized Time Weighted		1986 Time Weighted		12/31/86 Market Value	1986 Dollar Weighted	
	Rank	Return	Rank	Return		Rank	Return
Massachusetts \$100 million+	23	20.07	25	16.06	\$6,011,167,302	29	15.75
Massachusetts \$25-100 million	35	18.97	38	15.05	1,212,637,113	38	15.01
Massachusetts \$10-25 million	46	18.00	45	14.26	653,114,746	45	14.29
Massachusetts Under \$10 million	77	15.95	76	12.02	205,763,951	75	12.01

TABLE # 6A

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE By Size;
By Quarter

Size	1986 Time Weighted		1986 First	Quarterly		Investment Third	Returns Fourth
	Rank	Return		Second			
Massachusetts \$100 million+	25	16.06	10.06	02.21		-00.81	04.00
Massachusetts \$25-100 million	38	15.05	08.67	02.47		-00.29	03.62
Massachusetts \$10-25 million	45	14.26	08.53	02.83		-01.24	03.66
Massachusetts Under \$10 million	76	12.02	06.80	02.25		-00.58	03.16

TABLE # 6B

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE By Size;
By Asset Class

Size	Total Fund		Fixed Income		Equity		Cash	
	Annualized 1985-86	1986	Annualized 1985-86	1986	Annualized 1985-86	1986	Annualized 1985-86	1986
Massachusetts \$100 million+	20.07	16.06	20.37	16.10	21.15	15.14	07.53	06.40
Massachusetts \$25-100 million	18.97	15.05	19.49	16.39	31.53	18.24	07.86	07.68
Massachusetts \$10-25 million	18.00	14.26	19.39	15.86	28.86	18.47	07.98	07.46
Massachusetts Under \$10 million	15.95	12.02	17.98	14.28	28.95	16.58	07.83	07.47

SYSTEM PERFORMANCE BY SIZE

Table #6 indicates:

The 1985-1986 annualized time-weighted rate of return for each aggregate group and the ranking each group would receive if integrated with Table #1;

The 1986 time-weighted rate of return for each aggregate group and the ranking each group would receive if integrated with Table #1;

The December 31, 1986 market value of each group; and

The dollar-weighted return for each aggregate group and the ranking each group would receive if integrated with Table #4.

Table #6A indicates:

The 1986 time-weighted rate of return for each aggregate group and the ranking each group would receive if integrated with Table #1; and

Quarterly investment returns for each group.

Table # 6B indicates:

The 1985-1986 annualized and 1986 time-weighted rates of return for each group for the total fund as well as the fixed income, equity and cash portions of each group of funds.

We have analyzed the performance of the Massachusetts systems aggregated by the size of their portfolios (based on market values) in the following four groups:

* "Massachusetts \$100 million+" represents the four systems with assets in excess of \$100 million as of January 1, 1987 (the PRIT Fund itself is excluded from this analysis).

* "Massachusetts \$25-100 million" represents the twenty-four systems with assets between \$25 million and \$100 million as of January 1, 1987.

* "Massachusetts \$10-25 million" represents the forty systems with assets between \$10 million and \$25 million as of January 1, 1987.

* "Massachusetts Under \$10 million" represents the thirty-eight systems with assets below \$10 million as of January 1, 1987.

The Executive Summary accompanying this report contained the incorrect cash performance for the "Massachusetts Under \$10 million" group. The correct cash figures are reported in Table #6B.

The Fixed Income and Equity performance in the "Massachusetts \$100 million+" grouping for the two year annualized period and 1986 are weighted averages rather than the aggregated performance of the State Employees', Teachers', Boston and Middlesex County Retirement Systems. For the State Employees' and Teachers', the performance of the Treasurer's Fixed Income Securities Trust, Treasurer's Management Trust (equities) and the State Pension Reserve Funds within the Pension Reserves Investment Trust Fund have been used in the weighted averages.

One of the principal tenets underlying Chapter 66I was the belief that there are tremendous economies of scale and command of resources that can be attained by pooling retirement system assets together for investment purposes. A careful examination of the comparative performance analysis by size of pension portfolio, clearly gives testament to that Chapter 66I idea. There is a direct correlation between size and performance. The larger the fund, the better the performance. While there are individual exceptions, there can be no denying the basic premise. The table shows the correlation for the two-year annualized performance and for 1986. The same correlation existed in 1985: the largest four systems had 1985 aggregate performance of 24.21%; the next twenty-four, 23.03%; the next forty, 21.86%; and the smallest thirty-seven (excluding MWRA), 20.02%.

The charts accompanying Tables #1, #2, and #3 allow an evaluation of performance aggregated by size with comparative indices.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE
South Africa Analysis

PAGE ONE

TABLE # 7

System	1985-1986 Annualized		1986		% of Market Value Invested in		
	Time Weighted Rank	Return	Time Weighted Rank	Return	Cash	Non South Africa	South Africa
Adams	57	17.41	102	09.14	14.98	77.93	07.09
Amesbury	93	14.33	89	10.20	19.21	67.94	12.85
Andover	11	20.83	36	15.15	07.37	80.23	12.40
Arlington	43	18.38	18	16.65	07.02	74.85	18.13
Athol	88	14.75	94	09.82	31.46	52.10	16.44
Attleboro	73	16.34	63	12.91	13.98	73.72	12.30
Barnstable Co.	63	16.84	64	12.68	03.82	94.15	02.03
Belmont	71	16.52	97	09.59	04.76	60.80	34.44
Berkshire Co.	55	17.50	57	13.24	16.98	74.90	08.12
Beverly	64	16.78	61	12.98	21.80	76.30	01.90
Blue Hills	102	12.50	54	13.35	16.49	72.15	11.36
Boston	13	20.79	24	16.12	18.98	80.56	00.46
Braintree	31	19.60	21	16.40	15.96	72.64	11.40
Bristol Co.	75	16.14	79	11.43	08.31	72.58	19.11
Brockton	59	17.31	67	12.46	23.37	65.12	11.51
Brookline	96	13.99	76	11.79	10.17	89.29	00.54
Cambridge	2	24.10	16	16.70	07.34	86.32	06.34
Chelsea	39	18.64	52	13.47	01.68	92.79	05.53
Chicopee	83	15.28	87	10.53	07.64	78.52	13.84
Clinton	19	20.39	68	12.46	21.38	71.55	07.07
Concord	98	13.68	86	10.67	11.66	86.89	01.45
Danvers	92	14.39	92	09.83	09.72	76.75	13.53
Dedham	23	20.06	65	12.66	05.03	94.97	0.00
Dukes County	70	16.53	85	10.68	19.67	75.26	05.07
Easthampton	56	17.45	46	14.06	17.47	71.30	11.23
Essex County	9	21.10	12	17.15	12.19	63.95	23.86
Everett	47	17.91	50	13.56	-01.71	84.63	17.08
Fairhaven	81	15.45	95	09.67	10.10	N/A	N/A
Fall River	22	20.14	33	15.35	14.92	72.12	12.96
Falmouth	82	15.35	71	12.41	01.82	91.12	07.06
Fitchburg	97	13.87	70	12.41	01.61	80.53	17.86
Framingham	72	16.43	49	13.57	03.71	93.51	02.78
Franklin Co.	101	12.91	105	07.73	09.62	66.90	23.48
Gardner	74	16.15	62	12.94	16.54	N/A	N/A
Gloucester	10	21.05	19	16.57	00.58	71.22	28.20
Gr. Lawrence	106	07.48	106	07.28	75.55	21.19	03.26
Greenfield	85	15.20	58	13.19	27.36	71.04	01.60
Hampden County	60	17.28	47	13.87	18.47	78.10	03.43
Hampshire Co.	91	14.42	77	11.73	22.04	74.81	03.15
Haverhill	30	19.71	14	16.79	22.43	73.63	03.94
Hingham	38	18.76	34	15.32	11.32	84.84	03.84
Holyoke	12	20.82	45	14.15	04.39	76.67	18.94
Hull	94	14.28	80	11.36	06.42	86.21	07.37
Lawrence	48	17.82	72	12.24	04.09	89.31	06.60
Leominster	78	15.87	73	12.22	11.28	74.74	13.98
Lexington	16	20.47	31	15.67	08.28	89.75	01.97
Lowell	58	17.32	43	14.50	01.53	89.94	08.53
Lynn	49	17.80	75	12.20	07.73	69.70	22.57
Malden	80	15.65	99	09.38	02.63	72.18	25.19
Marblehead	89	14.67	104	07.87	06.12	68.62	25.26
Marlborough	79	15.74	91	09.90	20.02	77.94	02.04
MAFA	105	09.48	98	09.39	11.98	88.02	0.00
Mass Turnpike	29	19.76	13	16.90	15.77	71.65	12.58

System	1985-1986 Annualized Time Weighted		1986 Time Weighted		% of Market Value Invested in		
	Rank	Return	Rank	Return	Cash	Non South Africa	South Africa
MWRA	107	03.45	107	05.78	100.00	0.00	0.00
MassPort	18	20.41	9	18.68	03.99	88.38	07.63
Maynard	40	18.52	90	09.92	27.91	72.09	0.00
Medford	50	17.71	37	15.13	15.39	78.57	06.04
Melrose	37	18.80	20	16.49	12.64	76.46	10.90
Methuen	65	16.72	51	13.50	08.97	85.54	05.49
Middlesex Co.	36	18.84	39	14.90	08.32	87.32	04.36
Milford	95	14.19	103	08.97	28.78	70.52	00.70
Milton	67	16.60	82	10.94	03.26	N/A	N/A
Minuteman	53	17.52	1	22.05	01.34	N/A	N/A
Montague	104	11.20	101	09.16	12.69	N/A	N/A
Natick	25	20.05	42	14.56	14.77	80.56	04.67
Needham	21	20.17	4	20.75	08.34	N/A	N/A
New Bedford	54	17.51	48	13.68	27.15	71.95	00.90
Newburyport	90	14.50	100	09.18	18.40	68.42	13.18
Newton	44	18.33	44	14.33	23.06	72.39	04.55
Norfolk County	15	20.58	11	17.47	04.81	N/A	N/A
North Adams	66	16.61	93	09.83	07.38	66.10	26.52
North Attleboro	86	15.12	66	12.65	23.75	67.18	09.07
Northampton	61	17.16	69	12.45	02.37	66.50	31.13
Northbridge	87	14.75	88	10.34	12.61	68.33	19.06
Norwood	84	15.22	56	13.30	01.49	94.21	04.30
PRIM Board	7	21.37	7	19.94	01.99	N/A	N/A
Peabody	32	19.44	29	15.77	-01.61	79.60	22.01
Pittsfield	42	18.43	60	13.05	18.37	62.86	18.77
Plymouth	4	21.91	30	15.73	05.33	91.37	03.30
Plymouth County	14	20.62	15	16.71	07.72	78.02	14.26
Quincy	77	15.93	55	13.31	02.60	91.75	05.65
Reading	41	18.52	84	10.73	04.80	79.26	15.94
Revere	103	12.02	96	09.65	18.07	77.42	04.51
Salem	62	17.00	41	14.58	29.87	67.45	02.68
Saugus	100	13.00	78	11.50	25.33	N/A	N/A
Shrewsbury	45	18.30	8	19.34	16.31	N/A	N/A
Somerville	8	21.24	59	13.13	0.69	97.56	01.75
Southbridge	28	19.91	25	16.06	30.11	65.45	04.44
Springfield	51	17.65	38	14.91	25.99	71.65	02.36
State Employees'	24	20.05	23	16.16	00.68	N/A	N/A
Stoneham	26	19.98	22	16.38	19.63	66.27	14.10
Swampscott	34	19.10	83	10.86	00.35	68.86	30.79
Taunton	5	21.73	5	20.06	07.90	74.25	17.85
Teachers'	27	19.95	27	16.03	00.04	N/A	N/A
Wakefield	17	20.43	3	21.12	03.87	N/A	N/A
Waltham	33	19.39	17	16.65	05.74	84.64	09.62
Watertown	76	15.99	74	12.22	17.24	82.44	00.32
Webster	69	16.54	53	13.46	22.32	74.54	03.14
Wellesley	20	20.30	10	17.92	04.70	71.31	23.99
W. Springfield	99	13.47	81	11.20	04.58	74.23	21.19
Westfield	46	17.91	32	15.60	24.72	65.18	10.10
Weymouth	3	24.04	6	20.02	05.22	N/A	N/A
Winchester	35	18.96	35	15.26	19.16	68.02	12.82
Winthrop	68	16.58	40	14.68	21.11	76.97	01.92
Woburn	1	26.95	2	21.68	01.45	96.70	01.85
Worcester City	52	17.52	28	15.81	08.48	85.29	06.23
Worcester Co.	6	21.43	26	16.04	07.35	91.24	01.41

TABLE #7 SOUTH AFRICA ANALYSIS

Table #7 indicates:

The 1985-1986 time-weighted rate of return and ranking of each system listed in alphabetical order;

The 1986 time-weighted rate of return and ranking of each system listed in alphabetical order;

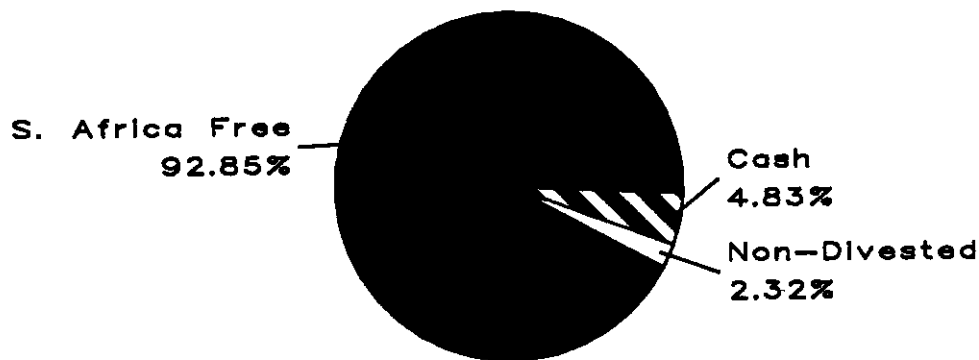
The percent of the December 31, 1986 market value of each system invested in cash (cash is defined as checking, savings and money market fund accounts);

The percent of the December 31, 1986 market value of each system invested in the short-term, equity and fixed income securities of companies not doing business in South Africa; and

The percent of the December 31, 1986 market value of each system invested in the short-term, equity and fixed income securities of companies doing business in South Africa.

Since January, 1983 the Commonwealth has invested its assets in enterprises free of involvement in South Africa. The State Employees' and Teachers' Retirement Systems, the PRIT Fund and the 12 participating systems in the PRIT Fund are investing South Africa free. Several local communities have followed the state's lead. As of January 1, 1987 over 97 percent of the \$8.082 billion in public pension assets is South Africa free.

Massachusetts Pension System South Africa Holdings



Total Assets: \$8.082 Billion

This Division uses a list of companies doing business in South Africa provided by Massachusetts Fiduciary Advisors, Inc. If, at the time of investment, a company is doing business in South Africa, that security remains as such, despite the fact that the company may no longer be doing business in South Africa.

For systems owning group annuity contracts and/or retirement plan funding agreements and mutual funds, this analysis does not include the underlying securities of such contracts and funds.

TABLE # 8

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE
By Investment Advisor

Investment Advisor	# of Systems	1985-1986		1986		12-31-86 Market Value	Dollar Weighted	
		Time Weighted Rank	Return	Time Weighted Rank	Return		Rank	Return
Alex, Brown and Sons	5	31	19.61	64	12.82	\$ 61,520,612	67	12.66
David L. Babson	3	46	18.22	39	14.81	21,842,434	40	14.79
David L. Babson w/multiple	4	29	19.85	44	14.40	52,153,622	45	14.33
Bank of New England- West	4	62	17.00	44	14.33	112,677,945	44	14.38
BayBank	4	35	19.07	36	15.16	99,204,498	37	15.11
The Boston Company	3	50	17.73	44	14.39	70,946,680	45	14.35
The Boston Company w/multiple	5			30	15.74	888,734,351	32	15.60
Constitution Capital Mgmt.	5	43	18.41	33	15.40	87,903,406	34	15.38
Constitution Capital Mgmt. w/multiple	8			38	14.95	224,584,570	38	14.99
de Burlo Group	10	69	16.57	85	10.72	170,183,568	88	10.56
de Burlo Group w/multiple	11			83	10.93	193,029,707	84	10.87
PRIM Board	11	22	20.15	12	17.39	165,270,690	12	17.19
PRIM Board w/multiple	16	32	19.50	25	16.11	5,484,173,617	29	15.78
Shawmut Bank	4	63	16.94	62	12.96	33,846,676	62	12.92
Tucker Anthony Mgmt. Co.	4	31	19.65	40	14.83	90,421,342	39	14.96
Tucker Anthony Mgmt. Co. w/multiple	5	28	19.91	41	14.66	120,732,530	40	14.73

TABLE # 8A

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE By Investment Advisor;
By Quarter

<u>Investment Advisor</u>	<u>1986</u> <u>Time Weighted</u>		<u>1986 Quarterly Returns</u>			
	<u>Rank</u>	<u>Return</u>	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>
Alex, Brown and Sons	64	12.82	10.02	03.16	-03.05	02.53
David L. Babson	39	14.81	08.11	02.25	00.89	02.95
David L. Babson w/multiple	44	14.40	08.02	02.80	-00.83	03.89
Bank of New England-West	44	14.33	06.59	02.79	00.30	04.04
BayBank	36	15.16	08.00	01.75	00.64	04.14
The Boston Company	44	14.39	07.05	01.51	00.83	04.40
The Boston Company w/multiple	30	15.74	10.69	02.11	-01.13	03.57
Constitution Capital Mgmt.	33	15.40	07.54	02.92	00.72	03.53
Constitution Capital Mgmt. w/multiple	38	14.95	07.47	02.49	00.27	04.08
de Burlo Group	85	10.72	09.79	04.58	-05.17	01.69
de Burlo Group w/multiple	83	10.93	09.51	04.36	-04.65	01.81
PRIM Board	12	17.39	10.63	03.18	-01.52	04.42
PRIM Board w/multiple	25	16.11	09.85	02.25	-00.72	04.12
Shawmut Bank	62	12.96	06.45	01.59	00.82	03.61
Tucker Anthony Mgmt. Co.	40	14.83	09.03	02.02	-02.16	05.52
Tucker Anthony Mgmt. Co. w/multiple	41	14.66	08.77	02.31	-02.12	05.27

TABLE # 8B

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE By Investment Advisor;
Annual; By Asset Class

Investment Advisor	# of Systems	1986 Time Weighted		Equity		Fixed Income		Cash	
		Rank	Return	Return	Allo- cation	Return	Allo- cation	Return	Allo- cation
Alex, Brown and Sons	5	64	12.82	15.85	43	14.93	45	07.68	12
David L. Babson	3	39	14.81	20.31	18	15.28	68	06.43	15
David L. Babson w/multiple	4	44	14.40	22.99	33	15.61	58	07.25	09
Bank of New England-West	4	44	14.33	28.19	15	15.17	56	07.01	30
BayBank	4	36	15.16	15.91	19	16.08	72	08.31	09
The Boston Company	3	44	14.39	28.07	12	14.00	66	07.66	21
The Boston Company w/multiple	5	30	15.74	18.24	24	17.06	58	07.43	18
Constitution Capital Mgmt.	5	33	15.40	21.40	23	15.86	66	07.46	11
Constitution Capital Mgmt. w/multiple	8	38	14.95	17.61	23	14.28	65	07.47	11
de Burlo Group	10	85	10.72	10.40	48	14.28	44	08.39	08
de Burlo Group w/multiple	11	83	10.93	10.88	45	14.57	45	08.17	10
PRIM Board	11	12	17.39	20.64	54	17.27	37	06.40	09
PRIM Board w/multiple	16	25	16.11	16.35	35	16.39	58	07.68	07
Shawmut	4	62	12.96	14.94	8	15.65	67	07.31	25
Tucker Anthony Mgmt. Co.	4	40	14.83	18.97	28	16.55	63	09.08	09
Tucker Anthony Mgmt. Co. w/multiple	5	41	14.66	20.47	32	16.38	60	08.88	08

TABLE # 8C

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT REPORT

SYSTEM PERFORMANCE By Investment Advisor;
Annualized; By Asset Class

	1985-1986 Annualized Time Weighted		Equity	Fixed Income	Cash
	Rank	Return	Return	Return	Return
Alex, Brown and Sons	31	19.61	33.27	18.94	07.94
David L. Babson	46	18.22	33.36	20.05	07.37
David L. Babson w/multiple	29	19.85	47.24	19.43	07.48
Bank of New England-West	62	17.00	38.30	17.80	07.23
BayBank	35	19.07	27.49	19.71	09.33
The Boston Company	50	17.73	39.12	17.55	07.74
Constitution Capital Mgmt.	43	18.41	27.40	18.95	08.53
de Burlo Group	69	16.57	24.57	17.58	08.98
PRIM Board	22	20.15	28.33	22.05	07.61
PRIM Board w/multiple	32	19.50	26.03	21.72	06.71
Shawmut Bank	63	16.94	29.81	20.73	08.02
Tucker Anthony Mgmt. Co.	31	19.65	33.55	21.71	08.55
Tucker Anthony Mgmt. Co. w/multiple	28	19.91	41.49	21.07	08.32

SYSTEM PERFORMANCE BY INVESTMENT ADVISOR

Table #8A indicates:

- The number of systems managed by each investment advisor managing three or more systems in 1986;
- The 1985-1986 annualized time-weighted rate of return aggregated for each investment advisor listed in alphabetical order and the ranking each investment advisor would receive if integrated with Table #1;
- The 1986 time-weighted rate of return for each investment advisor and the ranking each investment advisor would receive if integrated with Table #1;
- The December 31, 1986 market value of each investment advisor; and
- The dollar-weighted return for each investment advisor and the ranking each investment advisor would receive if integrated with Table #4.

Table #8A indicates:

- The 1986 time-weighted rate of return for each investment advisor and the ranking each investment advisor would receive if integrated with Table #1; and
- Quarterly investment returns for each investment advisor.

Table # 8B indicates:

- The number of systems managed by each investment advisor;
- The 1986 time-weighted rates of return for each investment advisor and the ranking each investment advisor would receive if integrated with Table #1;
- The annual return on the equity portion of the investment advisor's portfolio which includes common and preferred stock;
- The December 31, 1986 percentage of the investment advisor's portfolio invested in equities;
- The annual return on the fixed income portion of the investment advisor's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements;
- The December 31, 1986 percentage of the investment advisor's portfolio committed to fixed income securities and group annuity contracts/retirement plan funding agreements;
- The annual return on cash which includes cash and cash equivalent investments; and
- The December 31, 1986 percentage of the investment advisor's portfolio committed to cash.

Table # 8C indicates:

- The 1985-1986 annualized time-weighted rate of return aggregated for each investment advisor and the ranking each investment advisor would receive if integrated with Table #1;
- The annualized return on the equity portion of the investment advisor's portfolio which includes common and preferred stock;
- The annualized return on the fixed income portion of the investment advisor's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements;
- The annualized return on cash which includes cash and cash equivalent investments.

We have aggregated performance by investment advisors for investment advisors managing three or more retirement systems. We have also shown performance for the investment advisors that manage assets of multiple advisor systems (indicated in the tables as "w/multiple"). Systems purchasing shares in the PRIT Fund have been included in the PRIM Board performance with multiple advisor systems. For purposes of this analysis, the State Employees' and Teachers' Retirement Systems have been considered purchasing systems in 1986 only, not 1985.

For 1986, the aggregate performance of all waived systems and participating systems in the PRIT Fund was 15.71% and the aggregate performance of all "legal list" systems was 14.69%.

No annualized performance numbers are available for investment advisor performance including multiple advisor systems if the advisor did not manage any multiple advisor systems in 1985. This is true for the Boston Company, Constitutional Capital Mgmt. and the de Burlo Group.

The asset allocation for the PRIM Board reflects the actual asset allocation of the PRIT Fund. The asset allocation for the PRIM Board with multiple advisor systems reflects the actual asset allocation of the PRIT Fund for participating systems, and the actual asset allocation of TFIST, TMT and PRIT for the State Employees' and Teachers' Retirement Systems as participating systems.

APPENDIX 8-A

The systems included in the aggregate performance of each investment advisor are as follows:

Alex, Brown and Sons	Beverly, Clinton, Maynard, Somerville, and Webster.
David L. Babson	Blue Hills and Stoneham for 1985; Blue Hills, Methuen, and Stoneham for 1986.
David L. Babson w/multiple	Blue Hills, Holyoke, and Stoneham for 1985; Blue Hills, Holyoke, Methuen, and Stoneham for 1986.
Bank of New England - West	Hampshire County, Springfield, and Westfield for 1985; Greenfield, Hampshire County, Springfield, and Westfield for 1986.
BayBank	Attleboro, Everett, Fall River, and Waltham.
The Boston Company	Hampden County, Haverhill, and Watertown.
The Boston Company w/multiple	Boston, Hampden County, Haverhill, Middlesex County, and Watertown for 1986.
Constitution Capital Management	Arlington, Medford, Melrose, Middlesex County, Norwood, and Winthrop for 1985; Arlington, Medford, Melrose, Norwood, and Winthrop for 1986.
Constitution Cap. Mgmt. w/multiple	Arlington, Concord, Hingham, Medford, Melrose, Middlesex County, Norwood, and Winthrop for 1986.
de Burlo Group	Belmont, Bristol County, Franklin County, Lynn, Malden, Marblehead, North Adams, Northampton, Reading, and Swampscott.
de Burlo Group w/multiple	Belmont, Bristol County, Franklin County, Lynn, Malden, Marblehead, North Adams, Northampton, Pittsfield, Reading, and Swampscott for 1986.
PRIM Board	Minuteman, Needham, Norfolk County, Shrewsbury, Wakefield, and Weymouth for 1985; Fairhaven, Gardner, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, and Weymouth for 1986.
PRIM Board w/multiple	Minuteman, Needham, Norfolk County, Shrewsbury, Wakefield, and Weymouth for 1985; Fairhaven, Framingham, Gardner, Hingham, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, State Employees, Teachers, Wakefield, Weymouth, and Worcester for 1986.

Shawmut Bank

Athol, Braintree, Gardner, New Bedford, Northbridge, and Salem for 1985; Athol Northbridge, Salem, and West Springfield for 1986.

Tucker Anthony Mgmt. Co.

Essex County, Gloucester, and Peabody for 1985; Chicopee, Essex County, Gloucester, and Peabody for 1986.

Tucker Anthony Mgmt. Co. w/multiple

Essex County, Gloucester, Holyoke, and Peabody for 1985; Chicopee, Essex County, Gloucester, Holyoke, and Peabody for 1986.

The 106 Massachusetts Contributory Retirement Systems for public employees invest their assets pursuant to the provisions of Section 23 of Chapter 32 of the General Laws and Regulations promulgated as 840 CMR 16.00 through 22.05 by the Commissioner of Public Employee Retirement, with the approval of the Commissioner of Administration.

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